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THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2.

Telegrams: LANCET, RAND, LONDON. Telephone: TEMPLE BAR 7228 and 7229.

No. VIII., OF VOL. II., 1939. LONDON, SATURDAY, AUGUST 19, 1939. Pp. 104—Price 1s.
No. 6051. VOL. CCXXXVII. Founded 1823. PUBLISHED WEEKLY. Registered as a Newspaper. Annual Subscription: Inland £2 2s. Abroad £2 10s.

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No. 6051 LONDON: SATURDAY, AUGUST 19, 1939 CCXXXVII

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III *

Cardiac Neuroses

THE relationship between emotion and cardiovascular phenomena is too well known to require emphasis. Tachycardia, fainting, over-consciousness of the heart, a throbbing neck, even pain in the precordial and sternal zones may all be caused by nervous influence alone.

Cardiac neurosis may manifest itself by disturbances of rate, rhythm, or sensation, or by any combination of these. Common enough in civilian practice it is far more common under conditions of military stress, and it is probable that many more cases of "soldier's heart" in the Great War were due to emotional causes than to the various physical and infective factors which were blamed at the time. Nervous tachycardia, extra-systoles, the so-called "effort syndrome," simple paroxysmal tachycardia, and the cardiac component of vasovagal attacks (Gowers's syndrome) may all be reasonably included within the category of the cardiac neuroses. I shall here consider the two last-named only. These peculiar disorders, both intermittent and paroxysmal in a manner which characterises so many of the visceral neuroses, have scarcely as yet received the recognition due to their vivid and interesting symptomatology, to the degree of ill health and anxiety which they may impose, and to the physical and psychological characteristics of those who suffer from them.

SIMPLE PAROXYSMAL TACHYCARDIA

The accounts of paroxysmal tachycardia given in the textbooks are for the most part descriptive of the attack only, of the sensations to which it may give rise, the pulse-rate, the heart sounds, the abrupt onset and termination of attacks, and the cardiographic findings. The differentiation from paroxysmal auricular fibrillation (which in the absence of organic disease, thyrotoxicosis, or other manifest physical cause should also, perhaps, be accepted as a neurosis) and from the graver and more sustained paroxysms of flutter is duly and properly considered. But even so the picture is incomplete. It is as though one were to describe the asthmatic attack without describing the asthmatic patient, his antecedents, his attendant disturbances of health, and the factors in his life or environment which may be shown by long experience to be inimical. Reading my case-notes of patients with simple paroxysmal tachycardia I discover not only the usual points of interest attaching to individual cases but also a composite narrative and illustration which the textbooks seem to miss. Once again the necessity of studying the whole man and not merely his organ or his attack finds confirmation. Here are sample cases.

CASE 29.—A young man had been afflicted with a stammer from the age of 3. He had had erythema nodosum in childhood. At school he frequently fainted in chapel. He came on account of attacks of paroxysmal palpitation and volunteered that he had felt much better from the moment when the appointment was made. (How frequently we hear this comment in cases of neurosis, and how significant it is of the underlying anxiety and its present relief by a transference of decision and responsibility.) Three years previously he had first been troubled by slight attacks of tachycardia but was at first able to stop them by taking a deep breath. He had been excessively busy and considerably worried. He was a heavy smoker, consuming up to thirty cigarettes a day. His recent attacks had all started with feelings of heat and sweating; he then had an urgent call to stool and passed a bulky formed motion; then the tachycardia followed, and he quite often vomited. The tachycardia would generally last an hour or so, but on one occasion it had persisted for twenty-four hours. Although in a recent attack a medical man had counted the pulse-rate at 120 only, an observation which might have thrown doubt on the diagnosis, the patient himself, who was experienced in pulse-taking, described it in other attacks as "as much as he could count."

Here a mere description of the cardiac attack would have omitted much essential background and conveyed no indication of the much more general "explosion" manifest in the sweating and gastro-intestinal symptoms, or of ætiological factors and the modifications of habit likely to lessen the frequency of the attacks.

The three cases which follow illustrate the association of paroxysmal tachycardia with other nervous and visceral disturbance.

CASE 30.—A retired merchant, aged 69, had had bouts of typical paroxysmal tachycardia since school-days, coming at first at long intervals but in recent years more frequently. Lately he had developed spasmodic asthma. He had fears of driving in taxi-cabs, and yet if he started an attack out of doors he would at once jump into one and drive home. He dated his chief deterioration in health from an occasion when a doctor who saw him during an attack remarked that he was dying. The attacks would last from two minutes to five hours. One had lasted seventeen hours. Onset and termination were abrupt. His blood-pressure readings were 185/100. There were no other signs of disease.

CASE 31.—A man, aged 62, had spent a healthy life in youth sheep-farming until the age of 21 and thereafter was in business in the city until the age of 50. One night in June, 1918, after physical exertion followed by a big dinner and much tobacco he had his first attack of paroxysmal tachycardia. Thereafter, between 1918 and 1931, he had had seventy-six attacks. The pulse-rate in the attacks was about 160. They would start and usually end abruptly. He continued to play golf and to lead an active life. The attacks were preceded by a feeling "like a tennis ball" below his left ribs, and he associated them with his large bowel. There were no signs of organic disease.

CASE 32.—A medical student, aged 21, who had an extremely bad stammer, complained of attacks of paroxysmal tachycardia with pulse-rates up to 180 or 190 a minute, starting and ending abruptly. He remembered attacks in childhood but was then free of them for some years. They reappeared occasionally when he was startled. At first occurring approximately once a month they had lately become more frequent. They could be arrested by lying down. He recognised that attacks could be brought on by violent exercise but continued to play rugby football. He had also recently developed asthma, which was commonly induced by sneezing, coughing, or even by a deep breath. Usually the asthmatic attacks lasted a few minutes, but he had had one or two which lasted all night. They were cut short by inhalations of amyl nitrite. One maternal cousin was an asthmatic. An example of cardiac,

* The third Croonian lecture, delivered at the Royal College of Physicians on May 25, 1939. Lects. I and II have appeared in previous issues of THE LANCET.

respiratory, and speech "stammering" in the same individual.

In a series of 21 cases of simple paroxysmal tachycardia the ages varied from 21 to 76, with an average of 53 years. In the older cases the history of attacks often went back many years, and there was nothing to support the view that the degenerative changes of the later decades were contributory. In 3 cases there was a family history of asthma, and in 1 instance the patient's daughter also had paroxysmal tachycardia. In 9 cases the following associated neuroses were recorded: asthma and stammering; asthma, stammering, and colonic dysfunction; migraine and heartburn; aerophagy or "flatulence" (3 instances) and (in 1 of them) vertigo; colonic dysfunction; dysmenorrhœa. Anginal pain accompanied the attacks in 2 cases but did not occur at other times; 1 patient had angina of effort but had no pain in the attacks. Anxiety and worry in a few cases, and in 1 case startling events, were mentioned as conducive to attacks. When digestive disturbances were associated with them in the patient's mind, spastic colon and aerophagy seemed best to fit the symptoms described.

There are no good grounds for regarding simple paroxysmal tachycardia as an expression of cardiac disease or intoxication. The differential diagnosis is seldom difficult. Its intermittency, its persistence through long years without physical deterioration, its temperamental and other associations, and the absence of all organic signs bring it within the category of the neuroses. Although it may be associated with asthma, and although a severe tachycardia accompanies anaphylactic shock and serum-sickness, we are scarcely entitled to claim paroxysmal tachycardia as an allergic phenomenon. It may express the nervous constitutional endowment with which the allergic tendency is also commonly associated, but further than this we cannot reasonably go. In this respect it takes its place with the spastic colon, globus, and proctalgia. When, as may happen, organic disease or hyperpiesia is superadded, or sometimes when the attacks are very prolonged, then heart-failure may ultimately follow and even death. Asthma and angioneurotic œdema, which do not cause irreversible structural change in the bronchioles or the laryngeal mucosa, are also very occasionally fatal through secondary effects.

VASOVAGAL ATTACKS (GOWERS'S SYNDROME)

I have taken a particular interest in these strange and sometimes alarming seizures since first reading the description of them by Gowers in his "Borderland of Epilepsy" (Gowers 1907) some fifteen years ago. Although there are minor differences in description they are not, I think, to be separated from the angina pectoris vasomotoria of Nothnagel (1867). It is a matter for some surprise that they still so often escape recognition; that the cardiologists have not paid more attention to them; and that the psychiatrists are often content to dispose of them as "anxiety attacks"—a description which is only partly true and offers no hint of the features which distinguish them from other anxiety reactions. In general practice they are often loosely labelled "heart attacks"; this again is to be deprecated, for it tends to maintain the anxiety to which their perpetuation is in large part due. To me they appear as at least as worthy of separate consideration as ordinary faints, petit mal, or vertigo. They have a characteristic symptomatology; there are objective manifestations of a striking kind at the time of the seizure; they cause intense mental misery and physical prostration; during an attack the appearance of the patient may be sufficiently alarming for relations and even medical men to suppose that the patient is dying; and at times the differentiation from the anginal seizures of coronary artery disease is by no means easy.

Lewis (1932) prefers to employ the adjective "vasovagal" in connexion with ordinary faints or syncope, objecting that the components of Gowers's syndrome have not been sufficiently studied, and that the case for vagal and vasomotor effects is not so clearly established as it is with the faint. He emphasises the subjective at the expense of the objective features in Gowers's syndrome, but the latter are at least as striking as those observed in the faint and of longer duration. Gowers and Nothnagel described the facial pallor, the white and cold extremities, the subungual cyanosis, the contracted radial artery, and I have many confirmatory observations of my own.

A leading although not a visceral symptom is the sense of dying, or angor animi, a peculiarly terrifying and, as Allbutt (1915) insisted, an "organic" sensation, which is recorded occasionally also in the angina of coronary disease and in severe vertiginous seizures. Trained observers have noted it in themselves as the most disturbing symptom of too large a dose or too sudden an administration of adrenaline. It has also been noted by C. P. Symonds (private communication) in cases of tumour and gumma of the medulla oblongata. Accompanying this strange sensory experience there is commonly a sense of thoracic constriction and discomfort or actual and sometimes severe pain in the sternal or precordial region with radiation into the left arm and up the left side of the neck. The pain and constriction may accompany effort but are generally independent of it. Feelings of indescribable malaise, of helpless immobility, and a leaden feeling in the arms, more rarely with tingling or tetany, are also described. A sense of unreality at the onset of an attack is sometimes mentioned. Coldness, even with shivering, and prostration follow the attack; the prostration may persist for many hours. Very rarely there is a loss of consciousness; when this happens it is apt to last much longer than in a simple faint. The objective signs include pallor and coldness of the surface and extremities, extreme slowing or, conversely, acceleration of the pulse-rate, shallow and rapid breathing (which is probably responsible for the tetany when this occurs), and remarkable fluctuations in the blood-pressure. I have counted a pulse-rate of 44 in a woman whose husband, a doctor, had counted it as low as 30 during the height of other attacks, and in one attack, in which consciousness was lost, he made it as low as 19 a minute. In this attack she "looked like marble." Her earlier attacks were accompanied by sternal pain and were taken for true effort angina.

There are notable reminders of certain of the phenomena which accompany other paroxysmal disorders. Thus the same pallor and vasomotor changes are seen in fainting and vertigo, and again these are scarcely to be distinguished in their full development from the same manifestations in surgical or anaphylactic shock or an extremity of fear. The same prostration, often enduring for hours, follows a bad vertiginous or migrainous attack. The same pain and the same sense of constriction and immobility accompany the angina of effort. The occasional loss of consciousness reminds us of fainting and epilepsy.

Vasovagal attacks almost invariably occur in persons who are simultaneously afflicted by some slight impairment of general physical fitness and by

a chronic or recurring anxiety—a further example of the combined influence of several factors which would seem to underlie so many of the neuroses. Of physical factors the menopause or a low-grade infection or anæmia are especially to be remembered. Occasionally a sudden visceral disturbance may induce an attack. Colonic irrigation repeatedly caused attacks in one of my patients; a severe bout of sea-sickness in another.

On the basis of the foregoing description and the specimen case-reports which follow, some violent vasomotor disturbance with accompanying vagal effects, manifest especially in the occasional bradycardia, seem to afford the best explanation of the attacks. The anginal character and distribution of the cardiac pain point to coronary spasm. The vagal phenomenon of slow pulse-rate and the curious powerlessness and immobility which affect the limbs, taken in conjunction with the occasional appearance of angor animi in patients with organic lesions of the medulla oblongata, all suggest the inclusion of the medullary level in the nervous storm. Not dissimilarly the migrainous episode may mimic or suggest organic disease at a higher level by causing transitory hemiplegic symptoms. Associations both with migraine and epilepsy have been noted in patients liable to vasovagal seizures.

The close resemblance of the symptoms in some cases to those of anaphylactic shock make it tempting to bring Gowers's syndrome within the allergic category. Pallor, coldness, substernal oppression, and striking pulse-rate and blood-pressure fluctuations are common to the two conditions. It is thus of more than passing interest that one of my patients developed his attacks after a second course of tetanus antitoxin, and that another had had a preceding anaphylactic upset from bee-stings. Migraine was an associated neurosis in eleven cases, and mucous colic, angioneurotic œdema, and spasmodic rhinorrhœa each in one case. These observations notwithstanding, I prefer for the present to regard the syndrome as a non-specific manifestation of combined physical and emotional origin in patients of a particular constitutional type.

As with ordinary fainting, so with vasovagal attacks; the anxiety and uncertainty engendered by the attacks themselves may be reasonably regarded as a perpetuating or conditioning factor. In some patients the attacks recur at intervals over a period of many years. Sensible psychotherapy and attention to general health bring long or lasting relief to others.

In my series of 93 cases there were 31 men and 62 women; 77 per cent. were between the ages of thirty and sixty. Other visceral disturbances, referable especially to the stomach, and wide-spread vasomotor symptoms may accompany Gowers's syndrome, and cardiac symptoms are not present in all cases. They were recorded in 42 (just under 50 per cent.) of the present series and included precordial pain radiating into the left arm and up into the left side of the neck, a sense of constriction in the chest, and feelings of pressure and palpitation. Occasionally there was an associated sense of dyspnœa. Probably most cases formerly called pseudo-angina belong to this group. In 51 cases of the whole series, or rather more than half, angor animi or the sense of dying, a symptom which I have discussed formerly at some length (Ryle 1928, 1936), was the leading symptom. How can so peculiar a symptom be accounted for or defined?

According to the James-Lange hypothesis (James 1899) the emotion of fear represents the summation of all the sensory effects of the reflex bodily phenomena induced by a terrifying event. It might be argued on this hypothesis that the bodily phenomena due to the gravest known extremity of fear (namely that engendered by an immediate threat of death from some external cause), even when they happen to be otherwise induced, can still evoke the same sensations with the same conviction of death's imminence. The blanched and powerless misery of the unhappy criminal at the scaffold and the "frozen" state of the rabbit confronted by a snake or a stoat (a state with which one of my patients compared her own condition) may well include the angor animi of the patient who suffers from Gowers's syndrome. In all three states it might reasonably be argued that the physical sensations cause the emotion and not vice versa. When, therefore, Clifford Allbutt refers to the feeling of impending death as "an organic sensation" he may be employing, in less explicit form, the James-Lange interpretation. Of the reality of the sensation of impending dissolution in a vasovagal attack it is impossible to feel any doubt. Dread and panic may accompany it, but again and again it is described not as a "fear" but as an actual "feeling" of dying. Two distinguished colleagues, one a physiologist and one a physician, have told me that they had experienced this sensation after an injection of adrenaline.

Is it extravagant to argue that lesser anxieties in a debilitated and nervous subject may sometimes produce the total physical effects of extreme terror? May not new knowledge of the hypothalamus, viewed as a "central exchange" or "relaying centre" for the emotional impulse, help to remove existing physiological objections to the views of James and Lange?

CASE 33.—A small highly-strung woman, a "martyr to migraine," aged 37, was profoundly shocked by the sudden death of her husband during a game of tennis. She straightway felt extremely cold and soon afterwards became conscious of her heart and of dyspnœa on effort, and later of precordial pain and a sense of constriction across the sternum, which would develop either with or independently of effort and often wakened her at night. It became impossible for her to push her child's perambulator. There was no sign of organic disease. Blood-pressure 110/80. Later she became subject to attacks in which "she felt dreadful, not like an ordinary faint, her heart felt enormous, and there was tightness in the chest." One of these attacks immediately followed a bad migrainous episode, in which she had fasted for four days, and terminated with fainting.

CASE 34.—A nervous and introspective young man, with a nervous inheritance, underwent an exacerbation of his natural anxieties in consequence (*a*) of a series of deaths among his immediate colleagues; (*b*) of personal fears of disease; and (*c*) of apprehension in connexion with an imminent return to the east while still unfit, his wife and baby remaining in England. The symptoms which he described were at first regarded as cardiac; later his appendix was removed; and then he underwent treatment with emetine because amœbic cysts were found in his stools; finally duodenal ulcer was suspected, and he was given treatment which seemed to make him worse. His actual complaint was of precordial and left axillary pain with radiation down the inner side of the left arm, together with tightness in the chest, difficulty in breathing, and panic. There was no clear reference to food or effort. He was an air-swallower. There were no signs of organic disease.

CASE 35.—A woman, aged 39, overworked, saddled with many anxieties, and with a hypochromic anæmia, described recurrent attacks in which her heart

pounded and she was dyspnœic and had an overpowering sense that she was dying. The acute phase of such attacks would last half an hour, but they would leave her unsettled and anxious for many hours. At the beginning of an attack she experienced a feeling of unreality, and surrounding objects seemed unfamiliar and remote. In one attack with severe angor animi she saw her reflection in a glass; she was very pale with dilated pupils. Shallow breathing was noted and was followed by tetany. Apart from a hæmoglobin figure of 75 per cent. there was no sign of physical disease.

CASE 36.—A medical man, aged 43, liable to migraine from boyhood and with a history of duodenal ulcer at the age of 36, developed attacks characterised by a sense of unreality and of falling through the bed. Simultaneously he had strange feelings in the epigastrium and precordium and a feeling of impending dissolution. He was still liable to hunger discomforts, and the vasovagal symptoms were apt to develop in concert with these. Virginian cigarettes disagreed with him. There were no signs of organic disease.

CASE 37.—A nervous man, aged 46, with a cancerphobia and a liability to flatulent discomforts, was extensively stung by bees in June, 1936. An attack followed in which he had a sense of impending death and a weak slow pulse. During the next six months he had a recurrence of similar attacks. His pulse-rate would be as low as 50 at these times. Other symptoms described were dyspnœa, coldness and trembling. There was a bad psychological family history on his mother's side.

I have elsewhere described in some detail other cases belonging to this group (Ryle 1936). With minor variations there is a striking uniformity in the volunteered or elicited accounts. The dread even of naming the leading symptom may inhibit free description in the early stages of an interview. In two or three cases I have recorded severe pain indistinguishable from that of organic angina, from which the distinction was ultimately made by careful observation of the case over long periods of time, or by a change in the character of the symptoms or the circumstances of the attacks.

Multiple Visceral Neuroses

From what has gone before it is clear that there is often an association of several paroxysmal neuroses in one patient, and that these are not necessarily confined to the viscera. Hay-fever, migraine, or angioneurotic œdema may occur in conjunction with the spastic colon or with proctalgia, or asthma with paroxysmal tachycardia. The association of asthma and urticaria with neuroses of the abdominal viscera was noted by Allbutt (1884). Whether we regard the disturbances as manifestations of a humoral or emotional pathology, this is what would be expected, and it is, perhaps, worthy rather of remark that such associations are not more constant. The selective action of particular types of disorder or disease on particular organs or tissues is a chapter of pathology or psychopathology which still remains to be written, and the *locus minoris resistentiæ*, familiar enough to patients and physicians, but rarely finds a ready explanation in anatomy or physiology. With one patient or family the stomach, with another the heart, the bowel, or the bladder, with a third the lungs or the joints are recognised repeatedly as "weak-spots" in the constitutional defence.

It is to be noted, however, that multiple visceral neuroses rarely occur together in point of time. They alternate in a history or appear at different periods in a patient's life. In this respect we encounter an essential difference between so-called allergy and the more pronounced and specific anaphylactic response. In anaphylactic shock or serum-sickness in man we observe simultaneously or concentrated within a period of hours or days the symptoms of shock, with a profound fall in the blood-pressure; tachycardia; the sense of impending death; angioneurotic œdema; urticaria; asthma, and gastro-intestinal disturbances (usually with diarrhœa) and polyarthritis. As I have shown elsewhere (Ryle 1936) anaphylaxis in its most alarming form may occur in man not only immediately after the administration of serum but occasionally also a week later, replacing the more usual serum-sickness. The simple urticarial response is more usual, but in the less severe reactions intermediate between minor serum-sickness and grave anaphylaxis multiple phenomena are common. If the spontaneous disease (or allergy) is to be regarded as a true counterpart of the experimental or induced disease (or anaphylaxis), should we not expect occasionally to encounter examples of acute or recurring illness of a spontaneous kind with multiple and synchronous manifestations? Although they are rare, when we consider the great frequency of the isolated or separate manifestations, such cases do occur. A more intimate study of these cases, with a view to discovering the relative contributions of emotion and food or other allergy, would be particularly valuable.

Therapeutics

Of the physician it is naturally expected that he will give some account of the treatment of those diseases to which his attention has been closely drawn. In my early years a wise friend advised me never to write on treatment. Apart from some passing commentaries on therapeutic principle I have rarely gone counter to his advice. More follies and fallacies are perpetrated in the name of therapeutics than in any other branch of medicine or medical writing. They have been particularly numerous in connexion with the allergic disorders and the visceral neuroses. The genuine epoch-making advances today are derived from scientific experiment and the contributions of physiology, chemistry, pharmacology, and immunology. This does not, however, imply that the practising physician need become a nihilist or a disbeliever or deficient in useful method. The treatment of all diseases and especially of those of long persistence and without specific cause and remedy, is the treatment of the patient. It is an individual and personal affair, consisting largely of understanding and management both in a physical and a psychological regard. As such it is beyond adequate description. The best indications for appropriate treatment will be found in the best and most detailed account of the disease and its victims. Of no group of maladies is this more true than the functional disorders of the viscera, which, as has been shown, may be viewed as the ultimate expression of personality and inherited constitution in conflict with natural adversity. I could wish that my own descriptions had been better, but such as they are they should give the clue to many details of rational treatment.

The first essential is, as always, a diagnosis as confidently made and stated as possible. Indecision in the presence of a visceral neurosis, a questioning of "appendicitis," or of "heart-disease" or a "tired heart-muscle," of "inflammation" or "ulceration" in the bowel or bladder, can only perpetuate the anxiety which is the basic disease, or a part of it, and will tend to counteract such benefits as may accrue from other reassurance or from diet and regimen however suitably chosen.

The second essential is a simple and reassuring explanation of the nature and genesis of the visceral symptoms themselves and of their innocence so far as life and ultimate prospects are concerned. The third essential is an exploration, with the patient and sometimes with a near relation, of his habits and mode of living, his economic and domestic circumstances, his fears and doubts, and the provision of a definite, but not too elaborate, scheme of readjustment where readjustment is possible. Holidays, hobbies, relaxations, exercise have their part to play. Sensible dietary reforms, without suggesting that food is ever the *causa causans* of the trouble, are of value in heartburn and the colonic neuroses. Avoidance of condiments, strong tea, alcohol, and cooked fats in the former, and of what our American colleagues call "roughage" in the latter, may be reasonably enjoined. Under- or over-nutrition may call for appropriate advice. The purgative habit should be discountenanced. A hot bath may bring ease to an aching colon at the day's end. For paroxysms of tachycardia there are the various although rarely effective "tricks," such as abrupt change of posture, a hot or cold drink, or pressure on the carotids. Drugs should play only a subsidiary part and should be few. Sodium bicarbonate and aluminium hydroxide are useful for heartburn; belladonna, with some patients, for the spastic colon. Bromides are of assistance to some anxious folk but not to all. Barbiturates in judicious dosage may be used for the restoration of sleep lost through fatigue or anxiety or over-activity of mind.

If it be judged necessary to employ accessory methods of investigation, such as X rays, a chemical analysis, or the electrocardiographic tracing, it should be made clear to the patient that this is merely a contribution to thoroughness (which the anxious mind always appreciates) and for fuller definition and reassurance. Such methods can genuinely assist diagnosis and treatment not only by eliminating organic possibilities but also by demonstrating the type of a dysfunction.

Prognosis

Of the neuroses described it may be said, as with asthma, that they scarcely ever kill. Very occasionally paroxysmal tachycardia may cause a fatal failure. Vasovagal attacks appear repeatedly to threaten life, but I have never heard of a death. For the rest it may be said that these organ-neuroses again resemble asthma in the variety and irregularity of their behaviour. In some patients they occur once or twice only in a lifetime; in others they recur intermittently through many years. In some they are a cause of continuing distress of mind and body; in others an occasional nuisance arriving only in response to some extra load of care or irritation or a passing indiscretion or without discoverable cause. The graver cases are in the minority, but they can be very crippling and may even lead to periods of bed-ridden invalidism in the less robust. Particularly is this true of mucous colic, paroxysmal tachycardia, and Gowers's syndrome. The prognosis, in the long view, depends very largely on the personal qualities and reserve powers of the individual, on the attitude of relations, and not a little too on the patient's fortune or otherwise in escaping the diagnosis of organic disease and inappropriate physical treatments. The psychiatric ability of the medical adviser can play a really important part, sometimes in the actual relief of distress, sometimes in the encouragement given to lead a normal life in spite of it.

Ætiology Reviewed

In reconsidering ætiology should we not now remind ourselves that many people, who otherwise show little evidence of allergy or neurosis, experience on rare occasions in a lifetime one or other of the neuroses under review or some one of their familiar congeners? Are not the best of us at one time or another a little bit "allergic" or neurotic? In taking histories we often obtain an account of a solitary attack of urticaria or of a brief phase of asthma. A mildly migrainous subject myself, but otherwise blessed with excellent health, I have three times in my life at a time of great pressure of work and private anxiety experienced nocturnal proctalgia. An otherwise healthy member of my family has had a solitary attack of urticaria, anaphylaxis after a bee-sting, and colon spasm when cold and tired, and once or twice after a bad coryza has had bronchial spasm in mild degree. None of these have ever "made her a patient" in the ordinary sense, and all were so transient that they brought no interruption to a very active life. The diathesis for any morbid state must be an affair of degree as well as kind. About the mean which we call "normal" there extends in either direction an increasing or diminishing degree of liability to certain biological reactions to everyday fatigue and to certain endogenous or exogenous irritants, whether physical or psychological.

Emotion and certain physical factors, such as heat and cold, can produce manifestations commonly ascribed to allergy as well as certain less determinate visceral disorders. To say that neurosis and allergy can be separately recognised and classified is, perhaps, to create an artificial distinction which may hamper rather than assist our diagnosis, our treatment, and our ideas. I am not yet satisfied that this separation in the case of man is biologically sound.

Conclusion

A study of the visceral neuroses is a study of men and women, of personalities and temperaments, of heredity, habits, and environments, and of peculiar biological responses to common but often inconspicuous stimuli. These responses must constantly be thought of in terms of physiology, and for vague concepts and terminologies, such as "nerves" and "nervous heart," we must come to substitute these concepts which Cannon (1936) and Pavlov (1927) have made possible for us by patient experiment and clear exposition. The elementary emotions and reactions of men and cats and dogs are very similar. Amid the fret and swift vicissitudes of the present day and with increasing restraint upon the external expression of the emotions it is not surprising that their internal expression, at times in most of us and often in some, should become erratic and exaggerated.

In explanation of the visceral neuroses and of their tendency to be perpetuated over long periods of time we may invoke an inborn nervous instability, the conditioned reflex or habit, endocrine imbalance, and allergic sensitisation, operating severally or in conjunction. We may come to believe that the ultimate stimulus which promotes the spasm of plain muscle or the cardiac acceleration is specific and chemical. With the aid of physiological and pharmacological experiment we may discover better measures of counteraction and symptom-relief. But in the end our understanding and some of our best protective contributions are likely to derive largely from a clearer knowledge of the whole man, and from improved diagnostic achievement, which, if it

does nothing else, will save countless patients from the suspicion of organic disease and the numerous improper treatments which result therefrom. Without this clearer knowledge, moreover, psychotherapy must be denied the full scope and opportunity which its progress now requires.

As Clifford Allbutt (1884) so rightly insisted, the patients whose troubles, following his method, I have set myself to consider are very worthy of help. If they are sensitive and "barometric" they are also commonly intelligent, conscientious, industrious, useful, and active in times of health, and their ailments are very far from imaginary. Indeed, they may be as real and crippling as some of the structural diseases which affect the very organs which torment them.

I believe we would do well for the present not to become too subservient to the idea of specific ætiologies, and that in asthma, urticaria, and hay-fever we have, as practitioners, only a little more justification for an exclusive concentration upon the allergic hypothesis than we have in the case of heartburn, proctalgia, paroxysmal tachycardia, and the vasovagal attacks of Gowers. Non-specific therapy may certainly succeed in practice where "specific" measures fail. Would it not be wiser, while research continues, just to accept that there are certain human constitutions hypersensitive in their reactions to minor physical stimuli, such as dust in the case of the asthmatic, and cellulose residue or east winds in the case of sufferers from colonic spasm; to minor chemical stimuli, as in the case of the pollen- and horse-sensitive asthmatic and the egg-sensitive individual with his digestive crises; and to those numerous psychical stimuli which are known to be effective in determining so many of the visceral, bronchial, or cutaneous neuroses? Must we not also accept that in most of the patients afflicted with these neuroses any or all of these three types of stimulus may operate with identical effect at one time or another, and that the real rarities are those cases in which there is a single specific stimulus with a single effect? Taking this view, as clinical experience compels me to do, I feel that there is good justification for retaining "visceral neurosis" as a generic descriptive term.

For a more precise appreciation of the morbid behaviour of the viscera we shall look eventually to the contributions of physiology, expecting new light from its further investigations of the hypothalamus and the vegetative nervous system. Biochemistry and psychology will also lend their aid. Investigation by the methods of these sciences, however, will never preclude or prove competent without the more comprehensive clinical study of the total natural history of these interesting disorders. Such study must continue to fall to the physician, as human biologist, in his intimate associations with man in health and disease and in that much debated borderland which lies between.

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TRANSPLANTATION OF THE URETERS INTO THE RECTUM

BY MIROTVORTZEFF'S METHOD

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THE operation of transplantation of the ureters into the rectum, first done in Russia by Tikhoff's method in 1905 and then by the method introduced by Prof. S. R. Mirotvortzeff in 1909, soon became established in the treatment of various kinds of urinary incontinence, replacing Maydl's operation and other means of forming an artificial bladder. Maydl's operation proved to be technically more complex than separate transplantation of the ureters and it gave worse results with a higher fatality-rate. The ingenious methods of making an artificial bladder, either inside the abdominal cavity or from the skin of the abdominal wall, did not solve the main problem of preventing ascending infection. They led only to stagnation of the urine and precipitation of concretions, while they were quite unsuccessful in eliminating the principal cause of suffering—incontinence—because the new bladder has no sphincter.

MIROTVORTZEFF'S OPERATION

The surgical clinic of the Saratoff Medical Institute has records of 23 cases treated by Mirotvortzeff's method, and I have collected another 48 from other sources, making a total of 71 cases. The operation is performed as follows:

The patient is deeply anæsthetised and placed in the Trendelenburg position. The abdominal cavity is laid open from umbilicus to pubis and the intestines are retracted to the upper part of the abdomen. In small children it is difficult to keep the coils of intestine inside the abdominal cavity and they must be allowed to come out, an assistant keeping them covered with gauze soaked in saline. This increases the difficulty of operating on young patients but it cannot usually be avoided. The cord-like ureters can now be either seen or felt. In all cases of ectopia of the bladder in infants the ureters are dilated, but this is by no means a contra-indication for the operation.

An incision 3–5 cm. long is made in the parietal peritoneum above the ureter, which is isolated as low as possible near the bladder and cut between two silk ligatures. The vesical end of the ureter is touched with carbolic acid and the ligature cut; the stump disappears at the lower end of the abdominal incision. The temporary fixing ligature on the renal end of the ureter is left on, for it prevents the urine from dropping freely into the abdominal cavity, and also helps to keep the ureter close to the intestine for the anastomosis. This is usually made in the pelvic colon. One ureter is laid above the other, the left being generally sewn in first. The assistant fixes with his left hand the part of the intestine where the ureter will be transplanted. The surgeon then pulls on the ligature and places the ureter so that it lies obliquely downward and inwards on the intestine, after which three serous sutures are made over the ureter as in Witzel's gastrotomy. The sutures should be placed on the seromuscular layers of the intestine and the adventitia of the ureter far enough apart to avoid pressure on the ureter. The part of the ureter held by the ligature is cut off obliquely so that the site of the future anastomosis is oval. A sound 12–15 cm. long is introduced into the lumen of the ureter, and its patency is proved if some drops of urine flow out. Afterwards the cut part of the ureter is carefully lifted up with fine ophthalmic forceps, and the serous

and muscular layers of the intestine are incised under it. The mucosa of the intestine is lifted up by the forceps as a little cone and the top of it is cut off with curved scissors. The small amount of bleeding that sometimes occurs may easily be stopped by simple pressure. The end of the ureter is then laid in the incision in the intestinal wall and is united with it by four fine silk sutures, thus forming an anastomosis. It is this anastomosis that is the fundamental difference between Mirotvortzeff's and Tikhoff's methods. The last stage of the operation is the insertion of several nodal sutures over the anastomosis.

After washing his hands the surgeon goes over to the left side of the patient and sews in the right ureter in the same way. The abdominal wound is then closed. If the patient is a child we cover the wound with adhesive plaster or with broad gauze strips fastened with collodium and then with aseptic gauze. A Nelaton catheter is placed in the rectum. Owing to neglecting this last precaution we had two cases of intestinal eventration. The oblique cut at the end of the ureters, by increasing the size of the opening, prevents contraction of the lumen and consequent ascending infection; it is also helpful technically in making the anastomosis. Joining the "cup" of the ureter to the incision in the intestinal wall makes an ideal hermetic union.

In Tikhoff's method the ureter is put freely into the rectum after the insertion of some Witzel sutures. The absence of mucosa-to-mucosa fixation may allow displacement of the ureters into the abdominal cavity. This happened once in 90 operations in Tikhoff's cases, but was more common in animal experiments. Mayo and Coffey do not use Witzel's sero-serous tunnel, but incise the serous and muscular coats of the intestine and then place the ureter superficial to the mucosa. They think that the intestinal gases press on the mucosa and thus narrow the wide opening in the ureter and that this may prevent ascending infection. There are several objections to their method. Uncontrolled and more or less prolonged closure of the sewn-in ureters may cause retention of urine and consequent dilatation and atony of the ureters; thus the possibility of ascending infection is not excluded. The scar in the intestinal wall over the ureter is considerably coarser when the seromuscular layer of the intestine is cut than when the ureter is placed in the sero-serous Witzel tunnel. With a skilful operator there is no danger of compressing the ureter in the Russian methods. The insertion of a sound is a valuable precaution against obstruction.

We regard Coffey's suggestion of putting a catheter into the lumen of the ureter and drawing it out through the rectum as an unnecessary technical complication of the operation. He leaves the catheter in the ureters for 8–16 days and sutures the obliquely cut end of the ureter to the catheter with four nodal sutures. The extraction of the catheter is a highly dangerous procedure, for the sutures that fix the ureter may easily be torn out and it is possible to damage the mucosa of the ureter itself. In one woman who died from peritonitis 17 days after Coffey's operation the left ureter had been pulled 3 cm. out of place, and it was gangrenous; we put this down to the presence and extraction of the ureteric catheter. Another possible complication is blocking of the narrow catheter by urinary salts.

INDICATIONS FOR TRANSPLANTATION

The indications for this operation are well defined:

(1) Developmental defects of the bladder: ectopia, high epispadias, and absence of the sphincter. The operation may be performed even in the youngest infants.

(2) Uretero-vaginal and vesico-vaginal fistulæ.

(3) Malignant and some benign tumours of the bladder.

(4) Gunshot wounds of the bladder with multiple urinary fistulæ that do not respond to treatment.

(5) Accidental injury to the ureter during pelvic operations when it is impossible to repair it or to transplant it into the bladder.

Prof. Oppel and Prof. Mirotvortzeff are right in saying that these indications will in future be widened. At first both authors expressed some doubt about the suitability of the operation in ectopia, the latter regarding Maydl's operation as irreplaceable, especially in children under five years, and in Tikhoff's series of 90 cases of transplantation into the rectum there were only 2 for ectopia. We believe that ureter transplantation may ultimately replace Maydl's operation in all cases of ectopia. We have proved the possibility of operating at the earliest ages. Our youngest patient was five weeks old. It is true we lost him, but only because of a fault in technique. The operation wound was not covered with strips of adhesive plaster and on the fifth day there was intestinal eventration which required a new operation under chloroform narcosis. The child died on the seventh day with symptoms of peritonitis; the ureteral anastomosis was seen to be sound.

As early as 1908 Jelinek observed that if Maydl's operation was carried out in childhood there was less chance of an ascending pyelonephritis in later life. We have the same impression and think therefore that one of the causes of ascending pyelonephritis in ectopia may be renal disease beginning at some time before the operation. We cannot but agree with Prof. Oppel that "transplantation of the ureters into the intestine more often aggravates an already existing ascending infection than is the primary cause of one" (Matoussoff).

Undoubtedly the operation is very serious in infants and has a considerable mortality, but ectopia is itself a very dangerous disease. The gravity of the condition makes it important to remedy it as soon as possible for the parents' as well as for the patient's sake. For the mother it is less hard to lose such a child in the first half year of its life than at the age of four or five. We think the best age for operation is six months. Technically at this age the operation is not difficult—for the ureters to be sufficiently dilated is rather the rule than the exception—and we have always found it possible to do Mirotvortzeff's anastomosis.

TABLE I—FATALITIES IN CHILDREN AND ADULTS

Disease.	Operations.	Deaths (number and per cent.).
Ectopia	12	4 (33·3)
Uretero-vaginal and vesico-vaginal fistulæ	6	1 (16·6)
Gunshot wounds of bladder ..	1	0
Cancer of bladder	4	2 (50·0)
Total	23	7 (30·4)

CAUSES OF FAILURE

We have operated on ten children under four years for ectopia. The immediate mortality was considerable. Other deformities were present in 3 cases. One fatal case had a patent ductus arteriosus; another a rictus lupinus; and in one patient who recovered there was bifurcation of the ureters in the lower part. The fatalities in children and adults were as given in table I.

TABLE II—RESULTS OF OPERATION: MIROTVORTZEFF'S METHOD

Disease.	Cases.	Deaths.	Fatality-rate (per cent.).
Ectopia of bladder—			
5 weeks–5 years ..	16	6	38·1
5 years–10 „ ..	1	0	0·0
10 „ –20 „ ..	15	1	10·0
Over 20 years	5	1	
Total	37	8	21·6
Cancer of bladder	20	10	50·0
Fistula of bladder	12	1	8·3
Tuberculosis of bladder ..	1	0	0·0
Obstinate cystitis	1	1	100·0
Total	71	20	28·1

The cause of death in two children was shock, and in two others peritonitis. In one case of cancer of the bladder we lost a woman from peritonitis. In another a woman died from acute cardiac failure some hours after the removal of the bladder together with all the internal reproductive organs and the transplantation of the ureters; here it would have been better to have operated in two stages. We lost one patient after Coffey's operation on the 17th day from peritonitis; the left ureter was gangrenous for 3 cm.

TABLE III—TIKHOFF'S RESULTS

Disease.	Cases.	Deaths.	Fatality-rate (per cent.).
Vesico-vaginal fistula ..	53	12	22·6
Cancer of uterus and bladder	33	17	51·5
Ectopia	2	2	
Sphincter weakness.. ..	1	1	100·0
Tumour of bladder	1	1	
Total	90	33	36·6

upwards from the place where it was sewn in and was lying loose in the abdominal cavity; we consider that this happened because a foreign body—a catheter—was kept in the ureter. When he first began his method Coffey had to extract the catheter on the fourth day because it became blocked. In one of our cases we had to extract the catheter on the seventh day after a Coffey operation. Generally it comes out between the eighth and 16th days. To prevent the catheter becoming blocked by urine salts it is advisable to use aspiration, to wash it through with boric solution, and pass a special stilette down it. Extracted catheters usually show thick deposits of urates. We regard our method as the simplest and surest way of preventing this.

One death after operation was extremely instructive. A woman aged 28 had had a vesico-vaginal fistula for eight years. The ureters were transplanted into the rectum and urine began to flow within half an hour after the operation. For five days her condition was satisfactory; then she had severe meteorism, her eyes began to roll up and her nose became sharp, but her pulse was of a good tension at 80–90 a minute, and the abdomen was painless on palpation. Thus the clinical picture was not a clear one of peritonitis. The possibility of a leak in the anastomosis was considered but the daily secretion of 1500 c.cm. of urine allayed anxiety to a certain degree, although between the third and seventh days after these operations there should always be a considerable polyuria (amounting to 3–5 litres a day). The meteorism was increasing every day, and siphon enemata, injections of atropine and pituitrin, and intravenous injections of 10 per cent. saline all failed to give relief. On the 11th day there was clearly intestinal obstruction, with absolute constipation and continuous vomiting. A second laparotomy was performed. On removing the first sutures from the abdominal wound a transparent light yellow fluid resembling ascitic fluid flowed out. There was absolutely no urinary smell in this liquid and for that reason it was thought to be ascitic; the laboratory afterwards, however, proved the presence of urinary salts in it. The wound was reopened completely. There were no signs of peritonitis, the intestines being all equally distended, and attempts to find a mechanical obstruction failed. The peritoneum was found to be plastered over the anastomosis and no displacement or perforation was seen. The wound was closed with drainage. The

TABLE IV—RESULTS FROM RUSSIAN AUTHORS (SMITTEN)

Disease.	Recovery.	Deaths.	Total.	Fatality-rate (per cent.).
Fistula of bladder ..	125	37	162	22·84
Malignant tumour ..	37	61	98	62·25
Congenital deformity..	41	18	59	30·51
Inflammation	1	3	4	75·0
Total	204	119	323	36·84

patient died with symptoms of cardiac failure 36 hours after this second operation.

Post mortem it was established that the right ureter was sewn in higher than usual and its direction was not from above downwards. As a rule the ureter must meet the intestine at an obtuse angle; but in this case it was inserted in an upward direction at an acute angle. The result was a kink of the ureter followed by insufficient nutrition of its wall and a small leak at the anastomosis.

The conclusions to be drawn from this unfortunate case are as follows: (1) The details of this operation

TABLE V—RESULTS FROM RUSSIAN AND FOREIGN AUTHORS (SMITTEN)

Disease.	Fatality-rate (per cent.).	Total cases.
Fistula	22·8	214
Congenital deformity ..	27·6	345
Neoplasm	56·6	181
Inflammation	53·3	15
Total	33·6	755

are clear and the rules of operative technique must be followed; the ureter must be sewn in from above downwards without any kinks. (2) With extravasation of urine into the abdomen there is a characteristic picture of paralytic intestinal obstruction with a relatively good pulse. (3) Between the third and seventh days after operation there must be polyuria; even a normal output should lead one to suspect leakage at the ureteric sutures. (4) Urine extravasated into the abdominal cavity does not have the characteristic odour. (5) If the patient survives a leakage of urine for 10 days the second operation should be limited to draining the abdomen through a small incision only.

RESULTS OF THE OPERATION

In table II a summary is given of the statistics of recorded cases operated on exclusively by Mirotvortzeff's method. Tikhoff's results are shown in

table III, and those collected by Smitten from Russian and foreign sources in tables IV and V.

On comparing these collected statistics it will be seen that the total fatality-rate in operations by Mirotvortzeff's method is 5–8 per cent. lower than in the others. Such comparisons may however err through differences in the clinical material.

TABLE VI

Period under observation.	Successful cases.	Period under observation.	Successful cases.
0–6 mths. ..	72	3– 5 years ..	26
6 mths.–1 year ..	47	5–10 „ ..	21
1–2 years ..	60	10–20 „ ..	19
2–3 „ ..	31		

Many women who have had their ureters transplanted live a long and painless life. Women who have undergone such an operation in early childhood have often been able to work hard and have successfully given birth to a child. Cases have been reported where childbirth was fatal, and we have also had experience of this. Smitten was right in saying that even when the kidneys are healthy it is wiser, in some cases at least, to sterilise the patient.

The remote results of 740 operations of transplantation of the ureters into the rectum or of Maydl's operation reported by Smitten were as given in table VI. These statistics prove once more what a valuable procedure this is in the relief of the distressing condition of urinary incontinence.

The remote results are known in about half of our cases (table VII).

One of our patients became pregnant nine months after the operation. Owing to renal insufficiency a vaginal cæsarean operation was performed. In the following months she had periodic exacerbations of the pyonephrosis and she died 15 months later with symptoms of uræmia. The post-mortem examination showed bilateral pyonephrosis, the lumina of the ureters being quite patent. In this case there had been a fault in operative technique, the fallopian tubes being closed with only one ligature so that they soon became potent again.

All patients learn to distinguish between urination and defæcation, even in the first few weeks. They find that they can easily hold up to 200–300 c.cm. of urine, and develop a different type of reflex for defæcation.

Among the patients operated on by Mirotvortzeff's method three were kept under observation for long

TABLE VII

Period under observation.	Cases.	Result.
5– 6 mths.	3	One child died of one of the ordinary infectious diseases; two are healthy.
15–18 „	2	One woman died of uræmia after pregnancy; one healthy.
2–2½ years.	2	Healthy.
4–4½ „	2	Healthy.
19½ „	1	Died of calculous pyonephrosis.

periods: one for 15½ years, a second for 19¾ years, and a third for 20 years. Oppel [1] describes the case of a child of 8 years who was operated on for ectopia of the bladder in 1913, Mirotvortzeff's method being used. In 1929 the bladder was extirpated. In these 15½ years the patient had felt perfectly well. At the Leningrad Pirogoff Society in 1933 Moukharinsky reported a case in which the patient had lived for 20 years after such an operation, and in whom no renal or renal pelvis symptoms had appeared. The history of our longest case was as follows.

A woman aged 38 was admitted to Mirotvortzeff's clinic on Sept. 29, 1930, with symptoms of pyelonephritis. Oppel had transplanted her ureters in 1911 because of absence of the bladder sphincter. The patient lived 15 years without any complaints and became pregnant four times, an artificial abortion being performed each time. The excretion of urine and fæces were separate and called forth by different reflexes. The patient lived mainly on vegetable and milk food; she was less fond of meat than before the operation, but more partial to sour foods such as sauerkraut or lemons. Her first serious trouble was 16 years after the operation, when she had moved to some northern place and was living in poverty in bad hygienic conditions in damp lodgings. At this time she had to keep her bed for 6 months with symptoms of pyelonephritis. She kept fairly well after this for 2 years, when the same disease recurred. This was followed by an interval of 1½ years and then a fatal recurrence. At the post-mortem examination there was a right-sided paranephritis, an abscess and calculus of the right kidney, and an abscess of the liver formed by extension from the paranephritis. If we had recognised and opened the paranephric abscess in time it is very probable that the patient would still be alive.

CONCLUSIONS

1. The operation of transplantation of the ureters into the rectum in cases of ectopia of the bladder may be performed on the youngest children.
2. The remote results of the operation are best when the operation is performed in childhood.
3. Clinical observations show the possibility of a trouble-free life for many years after transplantation, but patients must keep to a special diet and take every precaution against damage to the kidneys.
4. Mirotvortzeff's operation shows the lowest direct mortality of the methods in use.

1. Oppel, V. A., *Vestn. khir.* 1929, **18**, 7.

ANALYSIS OF THE NORMAL P WAVE

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FOR analysis of the P wave the same material was used as for the Q R S deflection.[1]

The P wave is comparatively simple. Throughout the whole of it the lower part of the chest wall is positive to the upper part; and in the lower part the front is slightly positive to the back. The upper part of the chest is also very nearly iso-electric in this subject; but at first the clavicular regions on both sides are slightly positive to the scapular, becoming distinctly negative at the height of the wave. In leads taken from front to back in these regions the P wave, though very small, is unmistakably diphasic. The two stages are shown in figs. 1 and 2. In the first stage the voltages are so small and vary so much with respiration that anything like accurate measurement is impossible; the total range does not exceed 1·5 decimillivolts. The continuous line in fig. 1 roughly indicates the boundary between positive and negative, and the depth of shading and stippling the degree of positive and negative potential respectively. In the second stage more detail is possible; but even so the total range is not more than 3·5 decimillivolts,

1. Hill, A., *Lancet*, 1938, **2**, 1110

and the contour lines are only to be taken as approximations.

It is evident that the most positive area in this subject is more centrally placed than usual, for his standard electrocardiogram shows practically no

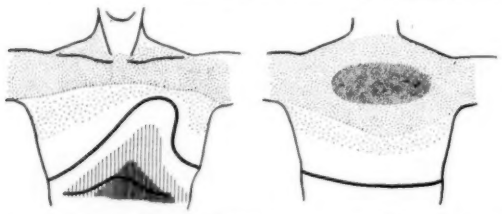

FIG. 1—The beginning of the P wave. Total range about 1·5 decimillivolts. The more positive areas are shaded and the more negative stippled.

P wave in lead I, while it is well developed in the other two leads. This may be due to the very thick layer of muscle overlying the apex and præcordium. The voltages recorded by the instrument are "surface" voltages and are approximately proportional to Vr/R, where V is the "intrinsic" voltage at the site of the contraction wave, r the resistance of that part of the circuit which lies between the points of application of the electrodes, and R the resistance of the whole circuit from one side of the contraction wave to the other through the conducting paths to the surface and the intervening length of thoracic wall. Anything that increases R—e.g., interposition of fluid between the heart and the chest wall, or greatly increased thickness of the chest wall—will diminish the surface voltage, though the intrinsic voltage remains unchanged. This would account for the low voltages found in pericardial effusion, without the necessity of invoking "tamponnade."

The mechanism of production of the P wave is easy to understand if we think of the contraction wave as a ring of small batteries travelling down the auricles with their positive poles in front and their negative poles behind. When the wave is starting on its journey from the sinus venosus, the whole of the auricular and ventricular blood in front of it will be positive and the blood in the superior vena cava and its tributaries negative. As the ring of batteries advances towards the A–V junction (fig. 3), more and more of the auricular blood will become negative; and, when it finally reaches its destination, just before it ceases to generate electricity, the whole of the blood in the auricles will be negative, while the ventricular blood is still positive. The positive electricity is conducted to the surface through the præcordium and the liver, and the negative to the root of the neck through the auricles and great veins.

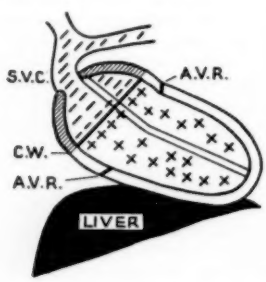

FIG. 3—The mechanism of the P wave. S.V.C. = superior vena cava; C.W. = contraction wave; A.V.R. = auriculo-ventricular ring.

This mechanism differs in one particular from that which produces the Q R S deflection. In the latter the contraction wave, travelling mainly from within outwards, creates a potential difference between the chest wall and the blood column as a whole; the auricular contraction wave, sliding down over the upper part of the blood column like a sleeve or bracelet, creates a potential difference between the two ends of the blood column. If these two events take place simultaneously, the currents will be superimposed and the resulting voltage will be the algebraic sum of the voltages of each wave; the condition is comparable to two batteries connected in series, and the P wave will be superimposed unchanged on the Q R S. But this rule of algebraic summation of simultaneous deflections does not apply to those produced by contraction of the two ventricles, for these are comparable to two batteries connected in parallel; and this does not result in summation of voltage. Thus, though the bi-cardiogram is, in a sense, a combination of dextro- and lævo-cardiograms, it cannot be their sum or even the resultant of their components along some particular axis. So, as suggested in my earlier paper, the concept of axis-deviation needs reconsideration. Hypertrophy of a ventricle wall will increase the duration of the current due to its activity, for the contraction wave has further to travel; it is not safe to assume that it will increase its voltage without direct experimental evidence. It seems more likely that the changes in

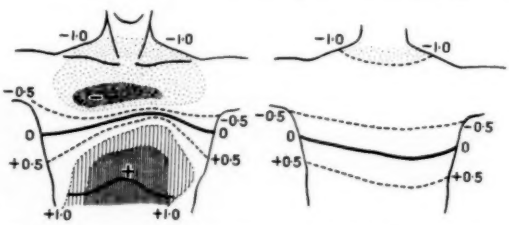

FIG. 2—The peak of the P wave. Total range about 3·5 decimillivolts.

distribution of potential on the surface are mainly caused by the effects of associated anatomical displacements on the conduction paths.

This analysis throws some light on the correct method of measuring the P–R interval. It is always measured from the beginning of the P wave to the beginning of the Q R S deflection. It will be clear that in any particular lead a deflection may appear later than the current giving rise to it if the two points of application happen at first to be iso-electric; but, if three triangulated leads are taken, the deflection can only be late in one of them, except in the rare instances when it is late or even absent in all three. It cannot be punctual in one lead only and late in the other two. It follows therefore that in the standard electrocardiogram there must be one lead at least in which both the P and the Q R S are punctual, and this will give the true reading. If in one of the other leads P is late and Q punctual, the interval will be artificially shortened; but, if P is punctual and Q late, it will be artificially lengthened. When, therefore, the measurements in the three leads are all different, the intermediate value (not the longest) is the true one; but, if two agree and one is different, the two that agree are right, whether the third is shorter or longer. This rule does not apply to measurement of a deflection (when the longest value should be taken) or of an interval measured from the end of one deflection to the beginning of the next (when the shortest value is right).

SUMMARY AND CONCLUSIONS

(1) Charts of the potential distribution on the surface during inscription of the P wave are given, and the mechanism of its production is discussed.

(2) The conditions necessary to summation of deflections are considered.

(3) The measurement of the P–R interval is examined.

MALNUTRITION AND DEBILITY IN PUERPERAL PSYCHOSES

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It is now generally accepted that there is no specific form of mental disorder associated with childbirth and that when mental illness begins during pregnancy, the puerperium or lactation, childbirth acts as any other factor might in precipitating one of the recognised forms of insanity. There are, however, in connexion with this particular factor of childbirth certain points worthy of consideration which are not always present in the case of other precipitating factors. First, it may be noted from the literature on the subject that it is very often associated with some other contributory cause; and the fact that many of these women have already had one or more confinements, and that many of them pass normally through later confinements, suggests that some other factor of a temporary nature—i.e., arising in connexion with this particular pregnancy—is involved. Secondly, during the period of pregnancy, the puerperium and lactation, patients are, or should be, under the supervision of their own doctor or of an ante- and postnatal clinic, so that if any contributory factor can be found whose elimination will help to minimise the risks of childbirth for potential psychotics, prophylactic measures should here be especially possible. In a review of 35 cases of mental illness associated with childbirth, in 28 of which additional precipitating factors are stated to have been present, Harris (1936) finds that their presence or absence does not appear to influence the patient's chances of recovery. It is, however, possible that without an additional factor the mental illness might never have arisen at all.

Table I—weights on admission

Diagnosis	Total cases	Normal	Above normal	Total	Below normal			
					4–7 lb.	7–13 lb.	1 st. or more	Total
Man. depressive..	38	6	3	9	9	8	12	29
Schizophrenic ..	21	2	1	3	2	4	12	18
Confusional ..	9	1	1	2	1	2	4	7
Total	68	9	5	14	12	14	28	54

The most important thing in the study of these contributory causes is the recognition of those which might be eliminated. Some, such as hereditary predisposition and life-long nervous instability, cannot be removed, but a knowledge of their presence in the early days of pregnancy should suggest an especial effort to build up the general powers of resistance and to eliminate additional preventable factors. Of the preventable contributory causes it is suggested that the two most important are (1) malnutrition and general debility, and (2) stress and anxiety, emotional or environmental. The following observations on 117 cases of mental illness arising in connexion with childbirth, who were admitted to Severalls Mental Hospital over a period of fifteen years, show how common these factors are. All the patients except 6 were admitted during the late months of pregnancy, during the puerperium or during lactation. In every case this was the first occasion on which the patient had been admitted to a mental hospital; 72 of the patients recovered; 60 had already had one or more normal confinements, and 12 have had one or more confinements since their discharge from hospital without developing any mental symptoms.

WEIGHT AND GENERAL HEALTH

The weight on admission to and discharge from hospital was noted in 68 cases. A certain number of patients were not weighed on admission, some being too ill physically (20), others mentally. The weights on admission have been compared with those given by Hutchison and Hunter (1938) as the average for normal women, age and height of course being taken into consideration. The weights of 40 healthy members of the nursing staff approximated closely to this standard.

Table II—alteration in weights while in hospital

Diagnosis	Increase				No change or decrease
	4–7 lb.	7–13 lb.	1 st. or more	Total	
Man. depressive..	2	10	23	35	3
Schizophrenic ..	1	1	13	15	6
Confusional ..	1	6	2	9	0
Total	4	17	38	59	9

The figures in tables I and II give some idea of the degree of malnutrition found in a great many of these women. It will be seen that on admission 54 of the 68 cases (nearly 80 per cent.) were below normal weight, 28 (41 per cent.) being more than 1 st. under weight; the remaining 14 patients were of normal or above normal weight.

Table III shows the alterations in weight while in hospital of the 54 patients who recovered, and it will be seen that in every case except one recovery was associated with an increase in weight (over 1 st. in 36 of the cases who were below normal on admission), while 8 of the 14 cases who did not recover showed no change or a loss of weight.

Table III—alteration in weights while in hospital of patients who recovered and who did not recover.

Diagnosis	Recoveries		Non-recoveries	
	Increase	No change or decrease	Increase	No change or decrease
Man. depressive ..	32	1	3	2
Schizophrenic ..	12	0	3	6
Confusional ..	9	0	0	0
Total	53	1	6	8

Only 28 of the 117 patients (23·9 per cent.) were found to be in satisfactory general health when admitted to hospital, none of these showing any sign of physical disorder. The majority were suffering from minor physical ailments; 80 had dirty, furred tongues and were and had been suffering from constipation; over 60 had carious teeth or pyorrhœa or both; 32 were suffering from anæmia, and, as has been shown, a great many were poorly nourished and underweight.

On admission 20 patients were seriously ill; these included 5 suffering from nephritis, 2 of them associated with streptococcal infection of the vagina; 2 eclampsia; 1 pyosalpinx; 3 toxæmia (2 associated with pyelitis); 2 lobar pneumonia; 1 bronchopneumonia; 1 phthisis; 1 severe anæmia; 1 valvular disease with anæmia; 1 follicular tonsillitis; 1 anæmia and ulceration of prolapsed rectum; and 1 hyperthyroidism. All had pyrexia on admission.

Less seriously ill but in poor physical condition were 11 cases of heart disease; 5 with a bloodstained vaginal discharge three or more weeks after confinement; 3 of arteriosclerosis; 3 of erosion of cervix; 3 of torn perineum; and 1 case of each of the following: vaginitis, breast abscess, nephritis, cystitis, bronchitis, pharyngitis, tonsillitis, otitis media, furunculosis, gingivitis, syphilis, measles, scarlet fever and thyroid deficiency.

In an address to the British Medical Association Dame Louise McIlroy (1937) suggested that "it is within the bounds of possibility that one of the determining causes of puerperal sepsis is defective nutrition with consequent lowering of resistance." It is also within the bounds of possibility that such defective nutrition with consequent lowering of resistance may play a considerable part as a determining factor in mental breakdown, especially in cases where nervous instability and environmental or emotional stress are also present.

STRESS

A history taken in the early days of pregnancy would have shown that 36 of these patients belonged to families in which a near relative had suffered from insanity, epilepsy or alcoholism; 29 had at some period in their life already shown signs of nervous instability; while 22 had undergone long and severe stress. The following records give some idea of what has been accepted as "stress" sufficiently severe to be a possible precipitating factor.

In 2 cases the patient's husband had been out of work for over two years; both these women already had three children and both owing to financial difficulties were themselves in an undernourished condition. A woman admitted during the puerperium suffering from measles had thirteen children, and had been nursing several of them with measles and running her home during her pregnancy. In another case the husband suffered from "shell-shock" and was in an acute anxiety state prior to and at the time of his wife's confinement which took place in her own home. Of the lactational cases, 2 were themselves in poor health but owing to financial difficulties were still nursing their babies a year after their confinements. A woman who had had a "nervous breakdown" seven years previously when she already had five children, and who had never really felt fit since this illness, had had two more children during these seven years but broke down at the birth of the eighth. Mentally abnormal relatives were living with 2 patients. Another lived throughout her pregnancy in constant fear of becoming like her mother, who had developed a chronic psychosis at childbirth when her own child was born. In 1 case the husband, wife, a small child, and the newborn baby were living in one room. Altogether 5 patients had given birth to illegitimate children.

It will be noted that in many of these cases the source of anxiety is also one of the sources of the mother's state of undernourishment and debility. Jones pointed out in 1903 that the incidence of puerperal psychoses was considerably higher among the rate-aided patients than among those of the "private" class; the same fact has been recorded in reports of the Board of Control and it is also true for the present group of cases. The difference in incidence between the two classes is large and suggests that precipitating factors may be present in the one which are absent in the others; of these, the first that come to mind are malnutrition, and financial and general economic stress. Codet and Badonnel (1924) emphasise the importance of the mother's attitude towards childbirth; where it is a desired event, joyfully anticipated and not likely to lead to financial and other difficulties, there is much less likelihood of symptoms associated with anxiety and fear developing than where the child is unwanted or where the presence of another member in the family is going to be the source of financial difficulty or an added burden to an already overworked mother. A friendly discussion, during the early months of pregnancy, of fears, anxieties, and emotional and environmental difficulties will in itself often do much to overcome them, and it will probably be possible to relieve at least some of the troubles brought to light in this way, and thus to reduce the stress and anxiety to which the patient is being subjected.

As has already been mentioned this group of potential psychotic patients is in a peculiarly favourable position for prevention, if such is possible, in that they are under supervision during the period immediately preceding the possible onset of mental illness, a time when prophylactic measures, both psychological and physical, may be of value, and when the earliest symptoms suggestive of mental breakdown—irritability, restlessness, undue fatigue, emotional instability and that almost universal early symptom insomnia—may be noted and dealt with. The opportunity is present for dealing with minor physical disorders and with sources of auto-intoxication, and much can be done to improve the general condition and build up powers of resistance.

It will be seen that of the group here investigated a great many patients had had to cope not only with childbirth but also with an inherited instability and/or malnutrition and a poor physical condition, and/or considerable stress and anxiety. Up to this time they had managed to cope with life (all were first admissions to hospital) and might still have done so if their physical condition, their power of resistance, and that "additional precipitating factor," stress and anxiety, could have been attended to in time.

SUMMARY

Analysis of a series of cases of puerperal psychosis showed that the majority were much under weight and in poor physical health; about a quarter had been exposed to severe economic or emotional stress.

Many cases could probably be prevented by attention to nutrition, general health and environmental conditions early in pregnancy.

My thanks are due to Dr. R. C. Turnbull for permission to use the hospital records.

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AFTER-EFFECTS OF EXPOSURE OF MEN TO CARBON DIOXIDE

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IN connexion with the loss of H.M. submarine *Thetis*, it was desired to determine the effect on men of breathing oxygen in an escape apparatus after prolonged exposure to air containing high carbon dioxide and low oxygen. The air in the submarine was under a pressure of about 8 cm. Hg above the atmosphere, the volume per man being 4710 litres. From the accounts of survivors it was judged that when they left the submarine after 17–18 hours' confinement the partial pressures were approximately: CO_2 6 per cent., O_2 16 per cent., N_2+A, 87 per cent. of an atmosphere.

J. S. Haldane or Lorrain Smith (1894) breathed air in a closed chamber for 7¾ hours until the CO_2 rose to 6·4 per cent., and the O_2 fell to 13 per cent. On emerging he had a headache and vomited. J. B. S. Haldane (1924a, 1924b) had the same symptoms after 1½ hours' breathing air originally containing 5–6 per cent. CO_2 and in which the CO_2 rose to a maximum of 7·3 per cent. He always vomited when the final percentage exceeded 6·5.

On the other hand Long (1924) had observed headache and nausea in two subjects breathing mixtures of CO_2 and O_2 in which the maximum CO_2 percentage was 11, and the maximum time of exposure fifty minutes. He did not record any aggravation of symptoms on breathing fresh air, though the symptoms continued for some time. The additional O_2 may have been responsible for this difference. It was therefore considered probable that the men in the *Thetis* suffered from headache and/or vomiting on breathing pure O_2 in their escape apparatus, these symptoms being due to the sudden fall in the CO_2 and not to the rise in O_2 breathed. However it was clearly desirable to find out whether an aggravation of symptoms was normal in such circumstances.

THE PRESENT EXPERIMENT

Messrs. Siebe Gorman and Co. kindly put a steel chamber of 5800 litres' capacity at our disposal. The conditions in the *Thetis* were duplicated as far as possible, the pressure being kept at about 1·1 atmospheres, and the CO_2 brought up to between 6 and 7 per cent., whilst the oxygen fell correspondingly. The figures given for CO_2 are partial pressures, that is to say percentages multiplied by 1·1.

A preliminary experiment was done to determine whether a gradual rise in CO_2 pressure had the same effect on J. B. S. H. as an abrupt rise.

He let N_2 and CO_2 into the chamber at 10.10 P.M. and the pressure was adjusted so that the partial pressure of CO_2 was 2·5 per cent., that of O_2 being about 20 per cent. The CO_2 then gradually rose and the O_2 fell owing to his breathing. The pressure fell from time to time owing to a slight leak, but was kept up with compressed air, so that the vitiation of the air followed much the same course as in a submarine. The dry-bulb temperature varied from 70°–74° F., the wet bulb being 2°–4° lower.

J. B. S. H. slept intermittently from 12.30 to 8.30 A.M. when the CO_2 pressure was 5·1 per cent. Panting was marked, but there was no distress. At 10·50 the CO_2 had reached 5·8 per cent. and the panting was severe, with slight headache, photophobia, and transient nausea. At noon the respirations were 44 per minute, but the pulse-rate was only 60, as compared with a normal figure of about 75. At 12.40 the CO_2 had risen to 6·6 per cent., and there was slight confusion, though the headache was not severe and there was no vomiting. He left the chamber, and put on a Davis escape apparatus.

After 2–3 minutes he removed the mouthpiece in order to vomit, which he did at intervals, probably bringing up about a pint of clear fluid. He had not eaten or drunk for the previous sixteen hours, in order to parallel conditions in the submarine. A violent headache developed, mainly frontal, but somewhat diffuse. This was severe for about an hour, and passed off about 5 P.M. Later he felt unusually well.

Four days later all of us entered the chamber, and remained for one hour in air with a high CO_2 content and correspondingly low O_2. The partial pressure of CO_2 was originally 6·1 per cent., but rose rapidly. After half an hour air was added and the pressure lowered, but at the end of the hour the CO_2 pressure had risen to 6·7 per cent. Unfortunately duplicate O_2 determinations did not agree, and the partial pressure of O_2 may have been as high as 18·7 per cent.

At the end of the hour all were panting severely, and P. D., who was awaiting operation for the sequelæ of five wounds received in Spain, was in considerable distress. On leaving the chamber all except J. B. S. H. put on Davis escape apparatus. W. A. removed the mouthpiece almost instantly, and vomited repeatedly, though he had had no food since a light breakfast seven hours earlier, and is a good sailor and does not vomit readily in other circumstances. He had a moderate headache. P. D. and D. R. had very severe headaches developing within a few minutes, and both were temporarily incapacitated. J. B. S. H. and G. I. had slight headaches developing after 10–15 minutes. All had recovered after three hours.

The slightness of J. B. S. H.'s symptoms on this occasion suggests that the after-effects depend on the time over which air containing above 5·5 per cent. of CO_2 is breathed, rather than on the concentration at the end of the experiment. It is however possible that on the occasion of the second experiment he was acclimatised to some extent. In view of his experience in 1923 this is unlikely.

DISCUSSION

In each of six persons who have breathed air containing CO_2 at a partial pressure of over 6 per cent. with normal or subnormal O_2, for an hour, there has thus been an aggravation of symptoms other than panting, when air or O_2 was breathed, and three out of the six have vomited. On the other hand there are marked individual differences in the symptoms. J. B. S. H.'s slight symptoms in the second experiment may have been due to his previous experience, but this could not apply to G. I., since none of the rest of us had ever taken part in tests of this kind. Similarly P. D.'s severe headache may have been partly due to his ill health. But this could not apply to W. A. and D. R.

It will be remembered that at least one of the men who tried to escape from the *Thetis* pulled off the mouthpiece of his escape apparatus and was drowned, and that only 4 out of 103 succeeded in escaping. It is suggested that some of the remainder were incapacitated by vomiting or other symptoms. It seems that in such circumstances men should breathe air or oxygen for 30 minutes or more before attempting to use the escape apparatus under circumstances where vomiting is fatal, and where calmness and some physical exertion are required.

It must however, be emphasised that the experiments here described were conducted hurriedly,

so as to permit one of us to give evidence at the judicial inquiry. There can be no doubt that experiments more scientifically carried out, on larger numbers of men, would give more definite results. Moreover a careful investigation of the vasomotor and other changes involved might throw light on the causes of headache. This can hardly be due to a sudden increase in the alkalinity of the tissues. For J. B. S. H. has frequently overbreathed so as to render himself so alkaline as to develop tetany and excrete a urine containing so much bicarbonate as to froth on adding acid. This has never produced a headache. On the other hand on one occasion he produced a severe acidosis with NH_4Cl. He then ate about 40 g. of $NaHCO_3$ to restore his pH to normal. This produced a severe but transitory headache, perhaps analogous to that here described.

SUMMARY

After breathing air with a partial pressure of over 6 per cent. of CO_2 for an hour or longer, five men experienced headache on breathing oxygen, and two of them vomited. The bearing of this observation on escape from submarines is discussed.

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ANTITUMORIGENIC ACTION OF PROGESTERONE

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UTERINE and extra-uterine abdominal fibromyomas produced in the guineapig by subcutaneous injection of follicular hormone develop in the non-castrated female with less constancy and in a lesser degree than in the castrated female (Lipschütz and Iglesias 1938, Lipschütz and Vargas 1939a and c). The difference in behaviour of castrated and non-castrated females is statistically significant (Lipschütz, Murillo, Vargas, and Koref 1939) and suggests that the antitumorigenic action of the ovary is due to the luteal hormone. This is corroborated by the following experiments.

Five castrated female guineapigs (225–475 g.) received subcutaneous injections of 80 μg. of œstradiol (the benzoic ester in olive oil) thrice weekly. Two of these animals were treated for 47 days and three for 90 days. All the animals revealed at autopsy uterine or extra-uterine tumours (figs. 1 and 2).

Five castrated female guineapigs (385–510 g.) were treated in the same way and with similar quantities of the benzoic ester of œstradiol. After 30 days three subcutaneous injections of 12 mg. of progesterone in olive oil were given weekly besides the 80 μg. of œstradiol. Two animals were killed after 47 days and three after 90 days. Only one animal (treated for 47 days) developed uterine tumours (fig. 3); there were no tumours, uterine or extra-uterine, in the four others. The total quantities of progesterone given were 84 mg. in 17 days and 288 mg. in 60 days; the relation between œstradiol and progesterone per injection was 1 to 150.

Most female guineapigs treated for two to three months with an ester of œstradiol show, besides uterine and extra-uterine tumours, also a remarkable development of hard fibrous tissue in the mesentery,

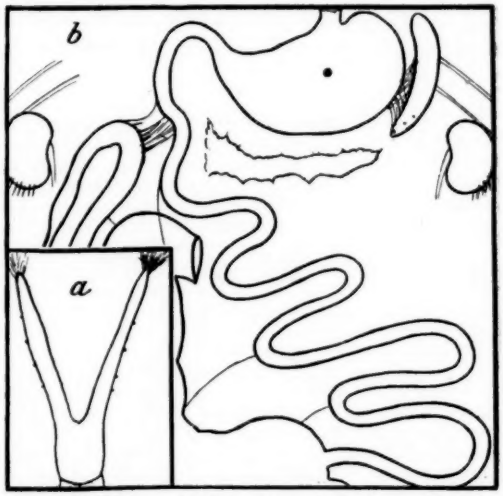

FIG. 1—Diagram showing sites of uterine and extra-uterine fibroids in a castrated female guineapig which had received œstradiol benzoate 80 μg. thrice weekly for 47 days: (*a*) small parametrial tumours, mark 0·5, and apical uterine fibrosis, mark 0·5; (*b*) fibrosis round kidneys, in mesentery, and between stomach and spleen, subserous gastric tumour, mark 1, and small tumours on surface of spleen, mark 0·5. Total mark 2·5.

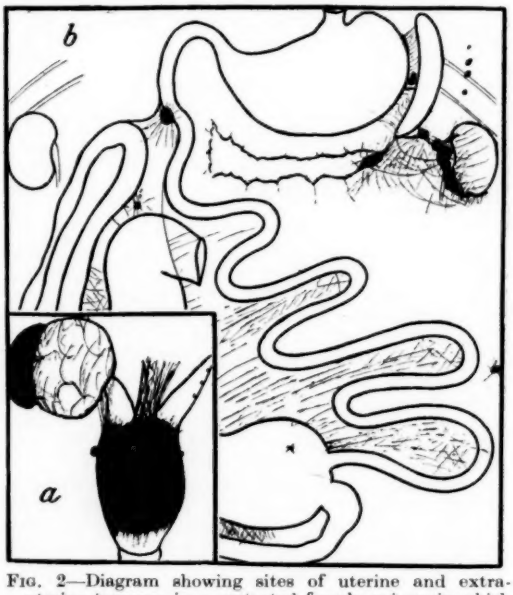

FIG. 2—Diagram showing sites of uterine and extra-uterine tumours in a castrated female guineapig which had received œstradiol benzoate 80 μg. thrice weekly for 90 days: (*a*) enormous tumour of ventral surface of uterus, mark 3, with adhesion of the epiploön, small parametrial tumours, and cystic dilatation of right tube with big tumour, mark 3; (*b*) tumours in mesentery, hilum of left kidney, and abdominal wall, mark 2, in hilum of spleen, mark 1, and fibrosis of mesentery, mark 0·5. Total mark 9·5.

round the spleen and kidneys, and elsewhere. This fibrous reaction was present also in the animals receiving œstradiol and progesterone but in a smaller degree than in those animals receiving only œstradiol.

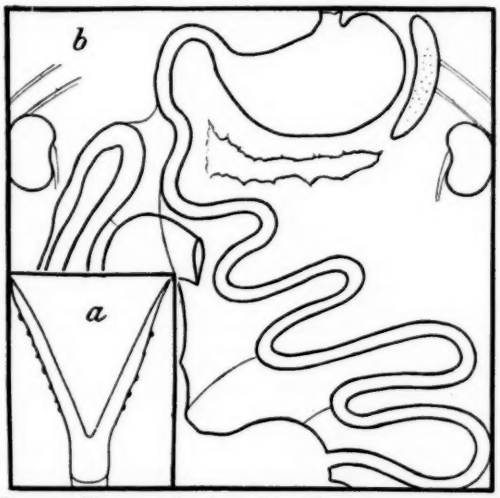

FIG. 3—Diagram showing sites of uterine and extra-uterine tumours in a castrated female guineapig which had received œstradiol benzoate 80 μg. thrice weekly for 47 days and simultaneously during the last 17 days progesterone 12 mg. thrice weekly: (*a*) small parametrial tumours, mark 1; (*b*) small tumours on spleen, mark 1. Total mark 2.

For the purpose of comparison we use a system of marks for tumours and fibrous tissue (Lipschütz and Vargas 1939b). The average mark of the group receiving only œstradiol was 4; the average mark of the group receiving œstradiol and progesterone was 1.

Our experiments with progesterone, though few, suggest strongly that this substance exerts an anti-tumorigenic action. The quantity of progesterone necessary to suppress completely the tumorigenic action of œstradiol benzoate is more than 150 times greater than that of the latter. According to Courrier and Cohen-Solal (1937) the œstrogenic action of œstradiol also is suppressed by a quantity of progesterone 200 to 400 times greater than that of the œstradiol.

Our results support the hypothesis that the development of uterine fibromyomas in women is due to a disturbance of the normal balance between follicular and luteal hormones and of their normal timing (Lipschütz 1939), and that progesterone may prove useful as a therapeutic agent against fibromyoma (*Lancet* 1939).

Our thanks are due to Messrs. Ciba, of Basle, and Laboratoires du Dr. Roussel, of Paris, for the benzoic ester of œstradiol; and to Messrs. Organon, of Oss (Holland), for the progesterone.

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AMYLOIDOSIS COMPLICATING STILL'S DISEASE

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THE following case presents unusual features in that diffuse amyloidosis developed in the course of Still's disease, there being no evidence, either during life or at autopsy, of suppuration, tuberculosis or syphilis.

CASE-RECORD

A girl aged 7 years was admitted to the Glasgow Royal Infirmary on April 21, 1932, suffering from pain and swelling of ankles and knees which had been present for six months. Her mother said that since the child had had acute rheumatism at the age of 3 years she had been subject to vague pains in the limbs.

On admission she was well-nourished but small for her age. There was some swelling of knees, ankles and tarsal joints of both feet, but no tenderness or limitation of movement. Radiography of joints showed no abnormality. Her tonsils were enlarged and the fauces were congested. The abdomen was normal and the cardiac sounds were pure. Her temperature rose to 99° F. on three occasions during her seven weeks' stay in hospital, but otherwise there was no pyrexia. The urine was normal.

In August, 1932, little change was noted on physical examination, but by November her general condition had deteriorated. Her wrists were swollen as well as her knees, ankles and tarsal joints and the tonsillar lymphatic glands had become palpable. Between November, 1932, and March, 1933, various signs appeared suggesting an "infective" source of her arthritis. For six weeks there was continuous irregular pyrexia up to 102° F. uninfluenced by sodium salicylate. On two occasions she had a fleeting erythematous rash and the spleen became palpable. She had a slight degree of anæmia (Hb. 82 per cent., red cells 4,170,000) and a polymorph leucocytosis (25,800 per c.mm., polymorphs 78 per cent.). However, by March, 1933, her general condition showed improvement. She spent the remainder of 1933 partly in hospital and partly in a children's home in the country. By the end of the year the proximal interphalangeal joints of the index and middle fingers had become affected and there was stiffness of the cervical spine. At this time her tonsils were removed.

The next three years were spent in the country. On Oct. 6, 1936, she was readmitted to the Infirmary, when it was evident that the disease had not been arrested by tonsillectomy and abundance of fresh air and sunlight. She was now 11 years old, small for her age but well-nourished in face and trunk. Her limbs had lost much muscle-substance and there was also some atrophy of the small muscles of the hands. She had a typical rheumatoid deformity of the fingers and hands. The wrists and elbows were moderately swollen and early contractures prevented full extension of these joints. There was fullness of knees and ankles with slight limitation of movement. Radiography showed osteoporosis. The lymphatic glands of neck, axillæ and groins were now palpable; the spleen had increased in size and the edge of the liver could just be felt. There was no ascites and, apart from a systolic murmur of functional type, cardiac examination was negative. Leucocytosis persisted (21,000 per c.mm. polymorphs 85 per cent.) and the anæmia had increased (Hb. 60–65 per cent., red cells 3,970,000–4,600,000). Blood-culture and Wassermann reaction were negative. The fundi were normal. In October and November she ran a

slight pyrexia, which occasionally reached 102° F. at night. Thereafter her temperature was normal, except for several days in February, 1937, until the few weeks preceding her death at the end of March, 1937, when it again rose. Her pulse-rate varied from 86 to 130 per min. during her pyrexial periods, remaining fairly constant at 110 per min. at other times.

Her urine was normal in October, 1936. During her intermittent fever it contained a trace of albumin, which slowly increased after her temperature had returned to normal so that it could evidently not be interpreted as a febrile albuminuria. For three months the albuminuria was moderate (Esbach 1–8). With the slight pyrexia in February, 1937, the albuminuria increased and during the seven weeks before her death the Esbach readings showed striking daily variations (2 to 24). In spite of such gross albuminuria casts were notably scanty. From time to time the centrifuged deposit contained a few granular or hyaline casts. There was no hæmaturia and the specific gravity was normal. The urinary output varied considerably; as late as March 6 the day's volume was 2300 c.cm. Slight ascites was noted in November, 1936, but it was not until two months later—after ten to twelve weeks' frank albuminuria—that œdema of face and limbs was found. Following the brief fever in February, 1937, the œdema and ascites increased considerably. Paracentesis of the abdomen was performed on two occasions, 40 and 45 oz. of clear fluid being withdrawn, containing protein 220 mg., sugar 108 mg., and chlorides 662 mg. per 100 c.cm. Her blood-pressure showed a slight rise from 90–100/60 in October, November and December to 110/70–80 in January, February and March.

From March 18, 1937, abdominal pain became increasingly severe and she required frequent doses of Nepenthe. She vomited several times daily. On March 25 her facies was hippocratic. Apart from two occasions in the last week when she was stuperose, she remained conscious until she died on March 29.

POST-MORTEM EXAMINATION

The body was very œdematous, the œdema involving the arms, legs and trunk. The heart was slightly dilated, the myocardium being pale and soft; the valves and coronary arteries were healthy. Both lungs were œdematous. The peritoneal cavity contained a quantity of turbid fluid. The liver was of a firm, rubbery consistence and gave a strong amyloid reaction with iodine. The alimentary canal presented no abnormality. The spleen was firm and gave a strong amyloid reaction of the sago type with iodine. The kidneys were pale, the capsules stripped easily and both organs gave a strong iodine reaction for amyloid. The suprarenal glands appeared to be normal but were not examined for amyloid. The brain presented no abnormality. The knee- and ankle-joints were swollen and the periarticular tissues were thickened and adherent. The cartilages of the knee-joints were eroded and the synovial membranes were opaque and thickened.

HISTOLOGY

Liver.—The parenchyma cells were separated into small groups by a homogeneous, eosinophil substance which gave the characteristic amyloid staining reactions with iodine, gentian violet and Congo red. This substance was most plentiful around the central veins of the lobules although it did not actually involve them, but was laid down in the walls of the liver capillaries. From the central parts of the lobules the amyloid material spread peripherally.

Spleen.—The malpighian bodies were enlarged, consisting almost entirely of amyloid substance, which extended into the pulp for some distance, compressing the surrounding reticular tissue. The central arterioles were in the main free from amyloid but a few showed a deposit of it in their walls.

Kidneys.—Many of the glomeruli were fibrosed and destroyed. Of the remainder, the majority presented a rich deposit of amyloid in their capillary walls; in the medulla, amyloid was present in the walls of many of the inter-tubular capillaries. A very small quantity was also present in the walls of a few capillaries in the thyroid gland and in the submaxillary salivary glands. None, however, was detected in the stomach wall, the cervical glands, the heart muscle or the periarticular tissues of the knee-joints.

DISCUSSION

Amyloid disease is a well recognised sequel to chronic suppurative diseases but it may also follow chronic non-suppurative conditions and still more rarely it arises as an apparently primary phenomenon. The original classification into localised and general forms put forward by Wichmann (1893) was in general use until Lubarsch (1929) distinguished a typical or commonly recognised form, and an atypical form. Various other classifications have been suggested and the most comprehensive appears to be that of Reimann and others (1935), who distinguished (1) primary amyloidosis, (2) secondary amyloidosis, (3) tumour-forming amyloidosis, and (4) amyloidosis associated with multiple myeloma. They admit however that there may be overlapping even in this classification.

In the primary form the tissues affected in the more common secondary form are not involved, the amyloid process affecting mesodermal tissues, especially those of the cardiovascular system, gastro-intestinal tract, smooth muscle and lymph-nodes; the amyloid material also shows variations in staining reactions and tends to form nodular deposits. Pseudo-sclerema and macroglossia are usually present (Pick 1931). This type is relatively rare, only about 35 cases having been recorded by Strauss (1933).

The secondary type is by far the more common. Here the amyloid is deposited in the liver, spleen and kidneys and gives the typical staining reactions. Tumour-forming amyloidosis tends to resemble the primary type in distribution but actual tumour masses consisting of amyloid substance are formed. Amyloidosis associated with multiple myeloma is a comparative rarity, 37 recorded cases being reviewed by Magnus-Levy (1933); the distribution here also resembles that of the primary type.

The present case is an example of the secondary type, and is remarkable in that there was no evidence of any of the primary diseases commonly associated with amyloidosis. Perla and Gross (1935), in reporting 3 unusual cases of amyloidosis, describe that of a girl aged sixteen years who had a ten-years history of recurrent attacks of arthritis. At the time of death her right elbow-joint was ankylosed because of thickening and shortening of the capsule but there was no evidence of suppuration; extensive deposits of amyloid were present in the liver, kidneys and suprarenal glands and death was due to uræmia. This case is comparable in certain respects to that described here. Both patients were young girls, both had a long history of arthritis with repeated short pyrexial attacks and both finally manifested some of the symptoms of chronic nephritis with œdema.

We are indebted to Prof. J. W. S. Blacklock for his helpful criticism and to Prof. A. W. Harrington for permission to publish the case.

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ANTIPELLAGRIC PROPERTIES OF QUINOLINIC ACID *

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Bills, McDonald and Spies (1939) have shown that pyrazine monocarboxylic acid and pyrazine 2:3-dicarboxylic acid are antipellagric substances. Woolley, Strong, Madden and Elvehjem (1938) have reported that quinolinic acid, the 2:3-dicarboxylic acid of pyridine, does not cure canine black-tongue. Recently Dorfman, Koser and Saunders (1938) and ourselves have found that quinolinic acid is effective as a growth factor for the dysentery bacillus in synthetic amino-acid medium. Because of the apparent variations in the response of different species, and because of the chemical relationship between pyrazine 2:3-dicarboxylic acid and quinolinic acid, we studied the response of seven selected pellagrins in relapse to quinolinic acid (Eastman).

Each of six patients who had moderately severe symptoms of pellagra received 1000 mg. orally, in divided doses, over a period of five hours. In every case response was dramatic. The fiery red glossitis and stomatitis faded within six hours after the first dose of quinolinic acid was given, and the tongue and mucous membranes regained their normal colour at the end of twenty-four hours. The burning sensations subsided, and the patients reported increased strength and sense of well-being following treatment. One of these patients was confused, apprehensive, nervous, and emotionally unstable. These symptoms were less noticeable within three hours after the administration of the first dose of quinolinic acid, and the patient appeared normal mentally at the end of twenty-four hours. One severely ill patient was admitted to the hospital and was given 1000 mg. of quinolinic acid each day for three days. At the end of forty-eight hours the colour of the tongue returned to normal, the Vincent's angina disappeared, and the macerated bullous dermatitis on the feet had begun to heal. In the seven cases the concentration of co-enzymes I and II in the blood increased from the low values found in pellagrins in relapse to normal values twenty-four hours after quinolinic acid had been given.

It has been shown previously (Spies, Bean and Stone 1938) that pigments soluble in ether and having a reddish purple colour in 25 per cent. HCl appear in the urine of pellagrins in relapse but that they are not found in the urine of dogs with black-tongue. The present study demonstrates another biological difference between human pellagra and canine black-tongue. Apparently, all the organisms which require pyridine nucleotides for normal cell respiration do not necessarily use the same pyridine derivatives for the biological synthesis of these nucleotides. Such biological variations can be explained by differences in the ability of the organism to utilise these compounds.

* This study was aided by grants to the University of Cincinnati from the Rockefeller Foundation and the John and Mary R. Markle Foundation.

SUMMARY

1. Quinolinic acid is curative for human pellagra.

2. The concentration of co-enzymes I and II in the blood increased following the administration of quinolinic acid.

3. Studies are in progress to ascertain the comparative usefulness of quinolinic acid and other therapeutic agents specific for pellagra.

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A CASE OF AYERZA'S SYNDROME

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MANY references have been made to a condition—variously described as atheroma of the pulmonary arteries (Rogers 1908), *cardiacos nigros* (Arrillaga 1913), Ayerza's disease (Warthin 1919), primary sclerosis of the pulmonary artery (Bedford 1927, MacCallum 1931), and syphilis of the pulmonary artery (Hare and Ross 1929)—in which the prominent symptoms are extreme cyanosis, dyspnœa, polycythæmia, cough, and enlargement of the right chambers of the heart, with ultimate cardiac failure.

Rogers (1908) described 10 cases which at autopsy showed atheroma and dilatation of the pulmonary arteries for which no cause was found. He suggested syphilis as a cause, owing to its prevalence in Bengalis, although only 2 cases showed definite post-mortem evidence of gummata. Arrillaga (1913) credited Ayerza with describing the syndrome in an unpublished clinical lecture in 1901 and concluded that the causes of *cardiacos nigros* were chronic pulmonary diseases leading to emphysema, and that syphilis might be a predisposing factor. Weber (1913) collected several cases in which he thought chronic pulmonary disease was a principal cause, and later (Weber 1920) did not think syphilis an important factor.

Histological evidence of syphilis has been produced by Warthin (1919), Clarke et al. (1927), Konstam and Turnbull (1929), and Hare and Ross (1929); but MacCallum (1931) reported a case in which the pulmonary vessels showed intimal thickening and a diminished lumen without any other morbid change. Sokoloff and Stewart (1933) reported a similar example, which they described as hyperplastic sclerosis of the vessels. Other non-syphilitic cases in which chronic pulmonary disease was present have been described by Clarke et al. (1927), Bedford (1927), and Paine and Platt (1931). Reviewing 24 cases, Hare and Ross (1929) concluded that syphilis was the most important cause in older patients but that a primary sclerosis developed in younger subjects. Fotheringham (1929) described an interesting case in which the pulmonary arterioles showed typical histological changes of thrombo-angiitis obliterans, and Montgomery (1935) found thrombosis of branches of the pulmonary artery.

Since 1930 there have been several contributions from South America (Ramos 1932, Blas Moia 1934, and, notably, Castex and Capdehourat 1932, 1933, 1934, who with Muzzei in 1937 considered the bronchial factor to be always an antecedent). Other cases are recorded by Samovici and Sack (1933), de Miguel (1935),

Legrand (1935), and others. Paretzky and Jorgensen (1936) considered the radiographic features to be a dilatation of the right ventricle and pulmonary artery and a movement of the diaphragm synchronous with systole and diastole ("dance of the diaphragm") superimposed on the respiratory movements. Kerley (1936) said that sclerosis of the smaller vessels appeared as small, round, and sharply defined opacities bigger than miliary tubercles, decreasing in size towards the periphery, and that the appearance closely resembled pneumoconiosis but could be distinguished from it by the absence of emphysema. In Ireland Freeman (1935) reported a case with a positive Wassermann reaction but no histological evidence of chronic disease of the lungs or pulmonary vessels. Rothschild and Goldbloom (1938) described the changes as an obliterating arteritis and suggested an allergic factor with vascular spasm from which pulmonary fibrosis developed secondarily. Atkinson (1938) surveyed the reported cases but came to no conclusion regarding the ætiology. Oszacki and Szczeklik (1938), following 19 cases to autopsy, found syphilis to be unimportant and could not distinguish between primary sclerosis of the pulmonary artery and sclerosis secondary to chronic cardiorespiratory disease. They concluded that sclerosis of the pulmonary artery did not necessarily produce the symptoms described by Ayerza.

CASE-RECORD

A caretaker, aged 51, had suffered from a cough on and off for years and was first admitted to hospital in January, 1937, being dyspnœic and very cyanosed. There were many expiratory rhonchi in the lungs and moist râles at the bases, with a moderate amount of sputum. After three weeks his bronchitis had cleared up and he was discharged although still slightly cyanosed.

He was readmitted in November, having had increasing dyspnœa on exertion for five weeks and swelling of the ankles, but no cough or sputum. His appearance was striking: an intense plum-coloured cyanosis, which was much aggravated by exercise and out of all proportion to the degree of dyspnœa. There was no clubbing of the fingers, the pulse was regular, and the heart was apparently not enlarged and gave no evidence of valvular disease. The lungs were emphysematous, and a few dry râles were heard at the bases. The liver was palpable and slightly enlarged but not tender. The spleen could not be felt. There was slight œdema of the ankles only.

A blood-count showed 126 per cent. hæmoglobin and 7·5 million erythrocytes per c.mm. The Wassermann reaction was negative. Electrocardiography showed considerable right ventricular preponderance. Radiographically the heart did not appear to be enlarged. There was a general increase in the pulmonary vascular shadowing but nothing to suggest that it was due to anything other than vascular engorgement.

His condition improved and, although remaining very cyanosed, he was discharged after eight weeks without being distressed. He was again readmitted in April, 1938, suffering from gross failure of the right heart, intensely cyanosed, orthopnœic, with much œdema of legs and lumbar pads, and ascites. Death ensued in four days.

Autopsy (Dr. A. C. Counsell).—A well-nourished subject showing gross œdema of legs and scrotum. Each pleural cavity contained about one pint of clear effusion. There was much emphysema of the pulmonary apices and anterior borders, with bullæ. The lung substance was indurated and congested. There were severe tracheitis and bronchitis. Pus was expressed from a few areas in the bases. There was gross right-sided hypertrophy and dilatation of the heart, affecting auricle and ventricle. About one pint of clear peritoneal fluid was found in the abdomen. The liver was congested and the spleen enlarged, hard, and dark red.

Microscopical section revealed dilatation of the bronchioles, catarrhal desquamation of the lining cells, and a mucoid exudate in the lumina. There was fibrosis of the peribronchial tissue, an infiltration with chronic inflammatory cells, and a diminution in the bronchial musculature. The lung substance showed chronic venous congestion superimposed on a severe emphysema. There was no pulmonary fibrosis. The arteries showed much medial hyperplasia without any change in the intima.

COMMENT

Ayerza's syndrome has many constant clinical features, the degree of polycythæmia being the most variable. It is found in a variety of pathological conditions, most of the cases being associated with chronic cardiopulmonary disease. The histopathological feature most constantly found is a sclerosis of the smaller pulmonary vessels; but in some cases this is absent. It may be that these conditions are merely predisposing and that the fundamental cause is undiscovered, or, more probably, that there is nothing specific about the syndrome, which depends on a decreased pulmonary circulation. The term Ayerza's syndrome offers a convenient clinical description but does not denote a disease entity.

I am indebted to Dr. J. B. Cook, medical superintendent of the West Middlesex County Hospital, for permission to publish this case; and to Dr. T. Nelson, senior physician, and Dr. A. C. Counsell, assistant pathologist to the hospital, for their assistance.

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". . . In the secondary schools, colleges and universities there are made available to students a vast array of courses for giving special training in almost any field one could wish to study. It seems surprising, however, that, of the students from these schools, so many of them seem to lack just what one would expect educated people to possess. They have such strong prejudices, political prejudices, social, religious, class and racial prejudices. They are so easily influenced and controlled by slogans, by propaganda and by dogma. They are so lacking in critical judgment, in poise, and so little given to looking for, and critically evaluating the evidence on both sides of a question. In fact, it often seems that people who have had a formal education are likely to have stronger prejudices, are less eager or less willing to hear both sides of a question than are those with less schooling. They are often more smug, more self-satisfied and less reasonable. This may be due to the fact that their training has made them complacent . . ."
Prof. OTIS F. CURTIS, *Science*, Aug. 4, 1939, p. 94.

CLINICAL AND LABORATORY NOTES

EFFECTS OF AN ARTERIOVENOUS ANEURYSM

By I. Douglas Miller, F.R.C.S.
HON. ASSISTANT SURGEON, ST. VINCENT'S HOSPITAL, SYDNEY

In the following case an opportunity presented of studying the alterations in circulation produced by an arteriovenous aneurysm of considerable size.

A man aged 43 consulted me because of an indolent ulcer over his left tibia, which had resisted all treatment and was enlarging. It was associated with varicose veins. He said that for twenty years he had had increasing palpitation and dyspnœa on exertion. This had led to cessation of work two years ago, and since then he had led the life of an invalid. He had been seen by many physicians, and his cardiac condition had been variously investigated and diagnosed as myocarditis.

On *examination* I found in the region of Hunter's canal a most arresting thrill synchronous with the heart beat. There was a small scar over the medial aspect of the thigh, and the patient said that twenty years previously a pea-rifle bullet had entered here and traversed his thigh. He had been aware of the thrill ever since but had not attached any importance to it. In the upper part of Hunter's canal there was a very large compressible pulsating swelling. A thrill was conducted from it down to the knee and could be felt all over the hypogastrium. On auscultation the bruit, which sounded like a "train in a tunnel," was audible all over the abdomen and even in the upper part of the other thigh. The superficial veins of the abdomen and lower part of the thorax were palpable, rather tortuous, and pulsating. The patient had obvious bounding pulsation in the neck, a typical water-hammer pulse, and capillary pulsation.

On compression of the arterial anastomosis he complained of intense discomfort in the head. There was an immediate and most pronounced drop in the pulse-rate. The normal rate was 72, and immediately on compression the rate fell to 50 beats a minute. The blood-pressure was that of an aortic regurgitation: brachial 132/61, left leg 120/60, and right leg 190/110. On occlusion of the aneurysm the brachial blood-pressure changed to 143/92. This occlusion reduced the pulse-pressure by 20 mm. Hg. The blood-pressure in the left leg, taken below the aneurysm, was very much less than the pressure in the sound leg. The heart was enlarged, the apex-beat being 5½ in. from the middle line. Radiography confirmed this finding.

When the patient was about to be operated on, I introduced wide-bore needles into the saphenous veins to observe venous pressure. On the right it was 28 cm. water, and on the left 36 cm. water. These readings are, of course, very high. In an endeavour to find out the alterations of blood return to the heart Dr. F. Cotton, of the physiology department in the University of Sydney, obtained the following figures by the acetylene method: oxygen consumption 248 c.cm. a minute, and cardiac output 6·1 litres a minute.

At *operation* I exposed a very formidable set of blood-vessels, a vein as large as the normal inferior vena cava, extending from just below the inguinal ligament to the lower end of Hunter's canal, and an artery which appeared to be very much bigger than normal. I considered it advisable to work with a tourniquet. It was difficult therefore to be sure of the site or the nature of the anastomosis. There were many small surrounding veins, which were rather adherent to the main vessels. I was able first to isolate the vein low down in Hunter's canal and to separate it very gently from the artery up to a point where I thought the anastomosis was placed. I then separated the vessels as high as possible and traced them downwards. In this way I approached the communication from a safe distance both above and below. The communication was not obvious, but the two vessels were attached side to side for about 1·5 cm. Above this point the artery was twice normal size and below was much smaller than normal. I performed a quadruple ligature and removed the vessels and anastomosis intact. The remainder of the vessels retracted very much, and we were left with an empty Hunter's canal—a rather frightening sight.

Effects of operation.—Immediately on removal of the tourniquet the leg flushed and became warmer than before operation. The pressure in the saphenous vein dropped to 28 cm. water, equal to the other side. Within a few days the ulcer had healed. After the operation the pulse-rate was 88, the pulse lost its "water-hammer" quality, the brachial blood-pressure was 130/90, the oxygen consumption was 251 c.cm. per minute, and the cardiac output was 3·8 litres per minute.

Description of anastomosis.—The internal diameter of the arterial inlet was 12 mm. and the outlet 4 mm. The arteriovenous communication measured 10 mm. in each direction.

This case gave an excellent opportunity to study an arteriovenous defect which simulated an aortic regurgitation. We were able to observe that, while the anastomosis existed, there was almost 100 per cent. increase in the return of blood to the heart and a consequent doubled cardiac output.

I am indebted to Dr. F. Cotton for his work on this case and to my house-surgeon Dr. W. P. Ryan for making numerous observations.

AN INSTRUMENT FOR CLEARING THE COMMON BILE-DUCT

By D. Lang Stevenson, F.R.C.S.
RESIDENT SURGICAL OFFICER AT SMITHDOWN ROAD HOSPITAL, LIVERPOOL

The removal of stones from the biliary tract is much simplified by the technique described here. In the first case in which we employed the method a stone was impacted low down in the common bile-duct. The usual manipulations through an incision in the duct had failed to move the stone at the ampulla, so that a trans- or retro-duodenal approach seemed unavoidable. Before this procedure was undertaken, it was suggested that a ball-ended needle that we have used for injecting varicose veins might be more effective than either sounds or forceps. The needle was accordingly boiled up. It was passed down the duct as far as the obstruction, and a 20 c.cm. Record syringe, which had been filled with saline, was attached. Fairly forcible injections were then made at intervals while the ball end was manipulated into different positions, under the additional control of the thumb and index finger of the right hand. In this way the stone was successfully dislodged and pushed on into the alimentary canal; some smaller stones and debris were washed back and removed through the incision in the duct. Patency was insured by passing the instrument into the duodenum.

This manœuvre took only a short time and caused comparatively little trauma. The method has subsequently been used in two smaller cases with equally satisfactory results. It has also been effective in the more or less straightforward case for clearing the duct of biliary mud and soft stones. A soft stone can be withdrawn quite easily by producing

suction with the syringe. Success in removing an obstinate calculus by this method is probably due mainly to temporary uniform dilatation of the duct by hydrostatic pressure. It is possible that by this means resort to the trans- or retro-duodenal approach may often be avoided.

The needle used, which is made by Down Bros. of London, was originally designed for injecting the distal varicose saphenous system from above and was later found an advantage in embolectomy (see *Lancet*, 1938, **1**, 27, 723 and 786). It is 10 in. long with a cannulated copper ball about 1/5 in. in diameter at the distal end. It fits a standard Record syringe and is flexible to a certain extent, in virtue of its length. For biliary work the needle may have to be slightly bent towards the end.

MEDICAL SOCIETIES

BRITISH MEDICAL ASSOCIATION

SCIENTIFIC MEETINGS, JULY 26–28

SECTION OF NEUROLOGY AND PSYCHOLOGY

WITH DR. R. DODS BROWN (Aberdeen) in the chair, this section discussed the

Significance of Auditory and Visual Hallucinations

Dr. P. K. MCCOWAN (Dumfries) said that formerly psychiatrists thought it important to differentiate clearly between hallucinations and illusions. Today the two phenomena were considered so closely allied that their presence was of equal significance. In certain cases, however, it was essential to differentiate between them, and sometimes the prognosis depended on this successful differentiation. Hallucinations in the sane were met with in poets, philosophers and religious mystics, and perhaps in ecstatic moments such people recovered the clairvoyant powers formerly possessed by man. At one time man understood his relationship to nature and to his fellow men by a process of pictorial and visual intuition, whereas today he understood the relationship by observation, experience and thought. There was thus in the process of civilisation a change in the mode of perception and man unfortunately had, through neglect, lost the former method of experiencing. This explanation was more in keeping with the lives and work of these men of genius than the derogatory alternative that their unusual experiences were really manifestations of temporary madness. Emphasis had now swung from the sensory to the subjective elements in hallucinations. Formerly it was held that the hallucination was a mental image so vivid that it was misinterpreted as a perception. Today the hallucination was regarded as a more-or-less ordinary image or thought, misinterpreted as a perception by the faulty judgment of the patient. While such a theory seems to explain the phenomenon of the acute hallucination, it was not convincing in cases where consciousness was clear. Such patients do not regard their experiences as ordinary perceptions, but describe them in terms of things heard or seen, for want of more appropriate words. This was well illustrated by Mayer-Gross's case in Bumke's handbook. Morel furnished experimental evidence in his audiometer investigations in finding that patients were unable to compare the pitch and intensity of their "voices" with the sounds of the audiometer.

Dr. MACDONALD CRITCHLEY (London) said that various neurological conditions, for example brain tumour, migraine, epilepsy and narcolepsy, could cause hallucinations. Hallucinations sometimes occurred in the sane—mass hallucinations, viridical and telepathic dreams. Karinthy in "A Journey round my Skull" referred to the hallucinatory noises which occurred during the early development of a cerebellar hæmangioblastoma. Stransky's symptom of *Gedankenhoren* occurred in temporal lesions and optical allo-æsthesia in occipital lobe lesions. But it was unwise to lean too heavily upon the occurrence and nature of hallucinations in localising intracranial lesions for they may be provoked by compression of cerebral arteries against the edge of the tentorium, or simple internal hydrocephalus. "Peduncular hallucinosis" of Lhermitte (a syndrome of mild confusion and lilliputian hallucinations) occurred most often in pituitary or juxtapituitary tumours. In drug intoxications a distinction should be made between acute delirium after poisoning from a single massive dose and states of chronic intoxication. Bromide intoxication produced hallucinations of hearing and sight and sometimes the latter had a lilliputian character. Cannabis indica produced hilarious intoxication followed by vivid hallucinations, as Gautier and Baudelaire described in powerful language. D. H. Lawrence's beautiful account of the hallucinations produced by mescal and De Quincey's description of opium visions were well worth reading.

Prof. HUGH CAIRNS (Oxford) said that in a series of 800 cases of verified intracranial tumour about 100 had experienced visual hallucinations. From a study of this series it was apparent that hallucinations in their crudest forms consisted of flashes of colour or white light without form or shape. More often the vision had definite shape and movement, usually away from the patient. More complex hallucinations related always to past experience; it is the diplomat who served in Japan and not the cook from Whitechapel who sees the Japanese warrior in tortoiseshell armour. But the ideas behind the hallucinations were simple and crude—pictures almost without a story. In no sane patient were they endowed with a purpose, as in the psychoses. With the hallucinations or independent of them, there were sometimes distortions of vision—for example, lilliputian hallucinations. Visual hallucinations were not linked with visual defects and earlier writers, such as Henschen and Horrax, laid too much stress on the position of visions. More important were the phenomena accompanying them. Hallucinations were usually short-lived but sometimes they had the deliberate quality of migrainous images. In a few cases of the series the diagnosis was made more difficult by the presence of visions. Hallucinations, as presenting symptoms, seemed to be especially characteristic of tumours of the occipital, parietal or temporal lobe. In two cases hallucinations occurred during ventriculography. From a study of this series it could be concluded that visual hallucinations could be produced by lesions involving any part of the cerebral cortex, optic nerves and chiasma and probably optic thalamus. This was understandable because of the elaborate nervous mechanism necessary for vision, and its correlation with other sensory impressions, and with space and movement. Visual hallucinations were as perfect a physiological experi-

ment as any that we were able to devise or understand. Electrical stimulation or excision of parts of the cortex were crude methods of revealing the activity of the cortex. It was only by the evidence of visual hallucinations that we were able to get any indication of the visual functions of the frontal lobes.

Dr. W. S. MACLAY (London) said that knowledge of hallucinations had depended mainly on verbal descriptions by patients of their experiences. Such description was not always satisfactory and could contain fallacies. Graphic representation provided additional information which might be more reliable and more objective. In work on the drawings of schizophrenic patients, it had been found that the scope of the investigation was apt to be limited by the patient's ability to draw. Some artists were found who volunteered to take enough mescalin to cause hallucinations. They then made sketches during and after the intoxication. Such pictures showed the typical mescalin patterns, ability to see structures at the back of the eye, photopsis, repetitive appearance of visual phenomena, wave-like distortion of vision, and a tendency of things to elongate themselves. In the series the elaboration which changes elementary visual sensations into hallucinations could be demonstrated. In the earlier pictures the repetitive phenomena could be explained in purely physiological terms, but in the later ones more and more additional features appeared which could only be accounted for in psychological terms. The comprehensible contents were in fact superimposed on the physiological phenomena which interfere with the definition of the visual perceptions. Both physiological and psychological considerations must be taken into account.

Dr. G. W. B. JAMES (London) thought Dr. McCowan's suggestion that hallucinations were a reversion to a more primitive type of thought an important one, and instanced the cinema and modern art as examples of such a trend. Lilliputian hallucinations were in his experience rare. He had seen only six cases in eighteen years' practice and all occurred in alcoholic, renal or senile cases. He thought that they were of grave prognostic significance especially in senile patients.

Dr. E. J. C. HEWITT (Shenley) drew attention to the importance of bromide intoxication, which tended to produce confusion and hallucinations. The blood-bromide should be estimated in all cases having bromide for any length of time. He had never encountered lilliputian hallucinations.

Dr. K. W. TODD (Gold Coast) asked whether telepathy had been sufficiently studied in its relation to hallucinations. Intuition would also repay scientific investigation.

Dr. RICHARD EAGER (Exeter) quoted a case of a woman admitted to his hospital as an epileptic, who saw everything upside down and wrote words backwards. Investigation showed that this was a functional condition and not epilepsy and she made a complete recovery.

Dr. D. BLAIR (Edinburgh) said that he had frequently been consulted about patients who were hallucinated as a result of an intense interest in spiritualism or religious thought. He quoted a case of this type which recovered on rest in the country. Dr. Critchley's and Professor Cairns's references to hallucinations in cases of intracranial tumour interested him for he had had a case which began with a hallucination of smell, and later showed typical signs and symptoms of suprapituitary tumour.

Dr. D. ROSS (Aberdeen) pointed out that lilliputian hallucinations were not always pleasurable and quoted a case of a woman who saw a minute news-reel of her husband being murdered.

Dr. D. R. MACCALMAN (Aberdeen) referred to hallucinations in cardiac disorder which, in his experience, were usually of horrifying scenes or of large furry animals floating through the air. Hallucinations of hearing of the tinnitus type were most distressing to the patient. Professor Cairns had quoted a case in which cutting of the optic tract cured crude hallucinations of sight and yet cutting of the eighth nerve did not alleviate tinnitus. Many hallucinations were defensive; this was well illustrated by Dr. McCowan's patient whose hallucinations kept her from screaming. He wondered whether patients who had hallucinations of organic origin had better insight than did psychotic patients.

Dr. MCCOWAN, replying, said that hallucinations in the sane were of an entirely different character from hallucinations in the psychotic; the regression theory did not necessarily explain psychotic hallucinations. One of his cases had pleasant lilliputian hallucinations, but he was unable to assess their significance because the patient would not discuss them.

SECTION OF OPHTHALMOLOGY

AFTER Mr. W. CLARK SOUTER, the president, had reminded the section that it last met in Aberdeen in July, 1914, a discussion was held on

Ophthalmic Services to the Civilian Population in National Emergency

Colonel ARCHER IRVINE-FORTESCUE (Aberdeen) began by giving a dramatic description of his experiences in Belgium twenty-two years ago when the resources of his unit were disorganised by the sudden arrival of some 2000 men blinded by mustard gas, at a hospital equipped for only a few hundred cases. He spoke of the dismay and difficulty of the situation, made worse by ignorance of the effects of mustard gas at that time. Rough and ready methods had to be resorted to and he urged the meeting to consider the horrors of unpreparedness. He then passed on to consider the effects of air-raids, apart from gas, on the civil population. Lessons could be learnt from the war in Spain and he deplored the "ex-cathedra punditry" which had allowed no unofficial reports from Spain to be considered and discussed. Two extremely useful books—namely, "Air Raid" and "A.R.P. Lessons from Barcelona"—already existed and he recommended their study. They emphasised the suddenness and completeness of the disorganisation that could be caused by high explosives. He thought all ophthalmologists should press for the formation of corps of consultants and for uniformity of procedure, since at the moment the matter appeared to be in the hands of some two hundred separate local authorities, mostly at loggerheads. He went on to discuss treatment and the equipment of mobile travelling ophthalmic units.

Mr. ARNOLD SORSBY (London) cited the motto of Marischal College, Aberdeen, "They say: What say they? Let them say," which he interpreted as the utterance of defiance or despair. In his case it represented despair. He considered the problem from the two angles of modern warfare—namely, *Blitzkrieg* and terrorisation of the civil population. At a rough calculation he estimated the probable casualties in London alone in the first fortnight of a war as 340,000. From 40 to 50 per cent. would be fatal, but this left us with a colossal problem. He did not think the danger of gas so great as that of high

explosive by which multiple major injuries were caused, the eye injury being only part of the picture. He dealt briefly with treatment and recommended evacuation of the civil population and organisation of base hospitals.

Prof. A. J. BALLANTYNE (Glasgow) spoke of the necessary organisation and the need for better instruction of first-aid workers in irrigating and examining eyes. He pointed out that in Spain the first-aid posts had been abolished finally, and all cases taken direct to hospitals. He dealt with the possibility of every doctor carrying certain equipment in his car and thus becoming a mobile unit constantly ready.

Mr. W. J. B. RIDDELL (Glasgow) referred to the use of cocaine and other corneal anæsthetics as a temporary preliminary treatment, to allow of evacuation of numbers of people temporarily blinded by gas.

This opened a lively discussion on the merits and demerits of treatment by vasoconstrictors and local anæsthetics. It brought out the need for further knowledge in view of the evolution of a new group of vasoconstrictors since the war. The opinion of the meeting was about equally divided between the view that cocaine was of value in alleviating symptoms and should therefore be used and the view that it damaged the corneal epithelium and led to ulceration. Colonel Irvine-Fortescue upheld the latter opinion very strongly. As regards the action of the ephedrine group of drugs it was felt that insufficient knowledge was available for a definite ruling.

Convergence Deficiency

Miss IDA MANN (London) showed by an analysis of 6400 case-sheets that convergence deficiency appeared to be responsible for the symptoms in roughly 2 per cent. of cases in private practice. It bore no relationship to age or error of refraction, though it was often associated with a neurotic or unstable history. This was not always the case, however, and by an appeal to Gordon Holmes's work on the cerebral integration of ocular movements she had attempted to explain the anatomical and physiological basis of the condition. The treatment, which was very promising, 69 out of 71 cases treated showing cure or improvement, consisted in improving "facilitation" of the cerebral pathways concerned by re-educative exercises designed to increase the range of voluntary convergence and the efficiency of stereopsis at the near point. The orthoptic exercises employed aimed in the first place at dealing with retinal neglect in cases with a strong master eye, by means of Wells's charts; this was followed by exercises in the voluntary production of physiological diplopia by convergence; and finally the patient was taught to fuse stereoscopic pictures by convergence without the use of a stereoscope. In this way full voluntary control of the extrinsic muscles and of accommodation could often be obtained and the symptoms disappeared.

Mr. O. GAYER MORGAN (London) referred to cases from his own experience bearing out these theories. Mr. MYLES BICKERTON spoke about the convergence amplitude required by the Royal Air Force, and Professor BALLANTYNE pointed out some important factors in testing for the condition.

Chemotherapy in Ophthalmology

Mr. FREDERICK RIDLEY (London) said that today chemotherapy was held to be almost synonymous with treatment by one of the sulphonamide group of drugs, but actually it had a much wider meaning than this. It should be defined as the use of an antibacterial substance capable of destroying or inhibiting bacteria in the tissues or on the surface of the body in a concentration harmless to the tissues. It therefore differed from shock or immunisation therapy and one must consider its effect on the natural defences of the body. If it lowered or destroyed these it was harmful; for example, eusol was an excellent bactericide but it also destroyed and inhibited the formation of lysozyme and therefore should never be applied to the conjunctiva. He then proceeded to deal with the various groups of drugs used as local applications in ophthalmology—salts of heavy metals, and antiseptics such as acriflavine and mercurochrome—and the action of the sulphonamide group either for local or general use. Among these last he had a slight preference for M. & B. 693. He described some hopeful cases in which both pneumococcal and gonococcal conjunctivitis had cleared up with remarkable rapidity after administration of sulphonamides in the usual dosage. It seemed important, however, to start the drug just at the point where the patient's own immunity was beginning to come into play, for it would then act synergically and the maximum effect would be obtained. Of the chemotherapy of trachoma it was not yet possible to speak dogmatically.

Mr. GAYER MORGAN proposed a new ætiological classification of traumatic myopia, according to whether it is traceable to (1) spasm (ciliary muscle and sphincter papillæ); (2) partial rupture of the zonule; (3) changes in the lens; or (4) serious damage to the coats of the eye causing axial lengthening.

Mr. COLE MARSHALL read a paper and showed a film on the treatment of retinal detachment. The PRESIDENT showed films of operations made by Professor Weve of Utrecht and Mr. H. B. Stallard.

SECTION OF ORTHOPÆDICS AND FRACTURES

Mr. ALEXANDER MITCHELL (Aberdeen) was in the chair for a discussion on

Delayed Union and Non-Union of Fractures

Mr. R. I. STIRLING (Edinburgh) said that in normal healing of long bones the deposition of calcium and other salts was due to the action of phosphatase on the monophosphatic esters at an optimum pH of 8·4. Fluid aspirated was at first mainly blood at pH 7·4; at later aspirations it became more acid (pH 4·7 on the fourth day); later it swung over to alkalinity, up to 8·2 or more. At this stage phosphatase was active. Calcium in the hæmatoma fluid was 10–20 times the normal blood figure. Experiments in vitro showed that a hypercalcæmic fluid stimulated bone cells. The causes of non-union were manifold. First were gross separation of the fragments and interposition of periosteum or soft tissues between the fragments, which might lead to pseudarthrosis. Interposed tissues must be removed. Lack of immobilisation caused repeated rupture of blood-vessels and so interfered with the chemistry of the hæmatoma fluid. Damage to the nutrient artery delayed union, for the collateral circulation was not fully established under 3 weeks; in such cases longer immobilisation was needed. If this precaution was ignored non-union resulted, especially in fractures of the mid-shaft of the humerus. Gross damage to vessels and nerves of the limb led to failure of mesoblastic tissue formation and so delayed union. Repair might cease through inadequacy of blood content. Vitamins A and B were normally deficient in the hæmatoma fluid, but if vitamin C was deficient there was

abundant callus formation with delayed union. Vitamin C should therefore be given early even when there was no deficiency, as was practised by Hertz of Copenhagen. In diabetes and hypothyroidism union might be accelerated by administration of the deficient hormone but glandular extracts in ordinary cases were of no proved value. In compound fractures a Vaseline pack could supply the missing bone-factory wall. Injudicious operations and use of metal plates sometimes delayed union. Experiments in vitro showed that calcium was not absorbed in the presence of metal. Even stainless steel was no advantage. Sepsis was a very potent cause of non-union. But the vast majority of examples of non-union were due to inaccurate anatomical reduction or to inadequate immobilisation.

The CHAIRMAN interpolated an account of a young man who 6 months after a plating operation in a fractured femur fell, broke the plate and was found to have no union whatsoever at the fracture site.

Mr. NAUGHTON DUNN (Birmingham) said investigation of the cause of non-union was an essential preliminary to operation. Syphilis must be excluded or treated. In compound fractures the nature of the original infection should be ascertained. Hendry in 1936 found 9 cases of delayed gas-gangrene as the cause of non-union. In Henderson's 211 cases of non-union at the Mayo Clinic, 66 per cent. had been plated. At Guy's Hospital, between 1911 and 1914, 457 cases had Lane's plates applied. In 1934, only in 6 cases was this done. This was surely conclusive evidence against the method. One must always ask if union would improve function. Sometimes any operation would be harmful. Sometimes osteotomy or removal of fragments might be the procedure of choice. Where an appreciable gap occurred in ununited fractures of long bones, this could only be successfully bridged by an autogenous bone-graft. In a case of fracture and effusion into the lower radio-ulnar joint, with abolition of pronation and supination, removal of a piece of the lower third of the ulna restored the movement. A postman who walked 18 miles a day without inconvenience on the shortened leg had an ununited fracture with extreme deformity of the tibia and fibula at the lower end. Operation would here have been unwise. In fracture of the patella and internal malleolus, removal of a fragment restored continuity and function. For non-union with fragments in contact, for example flail shoulder or elbow, Mr. Dunn described an operation which had been successful in 22 consecutive cases. The principle was to utilise living bone-grafts to surround the fracture at the site of non-union. The bone ends were exposed and freshened and, when necessary, subcortical grafts were inserted around the fragments. In non-union of the tibia following osteomyelitis, transposition of the fibula resulted in reduction of shortening and restoration of stability. Success had attended transposition of the fibula in two cases of congenital non-union of the tibia.

Dr. PHILIP D. WILSON (New York) criticised sweeping condemnation of plating. Lane's plates were disastrous; the studies of Venable and Stuck had shown that the presence of metal gave rise to electrolytic action with calcium and other salts, and delay resulted. But if Vitallium, a cobalt-chromium alloy, was used, this did not occur. Operation was not often necessary, but when it was done it should be done early and confident fixation effected. Dr. Wilson preferred living grafts, fixed by vitallium screws. The fibula was the best graft in cases of pseudarthrosis. Often the fibula itself united, after the graft from it had taken in the tibia. This might be due to efficient immobilisation.

Mr. ALAN TODD (London) rebutted the argument against Lane's plates by pointing out that in the period quoted by Mr. Dunn the no-touch technique of Lane and Fagge was not being used. Probably on account of jealousy, their successors refused to employ this method which had never been surpassed. By 1934 these men had retired. Mr. Dunn should give the figures of the successes as well as the figures of non-union. Lane never plated compound fractures or cases of non-union except during a short period of the war. He agreed with Hey Groves that excessive fixation was bad. Steadying but not rigid fixation was better practice.

Mr. H. O. CLARKE (Manchester) asked Mr. Stirling what was the best time for operation in a recent fracture. Plating was not such an evil as Mr. Dunn claimed. In the Presbyterian Hospital, New York, by routine plating, they succeeded in returning their cases to work more quickly than we could. In congenital pseudarthrosis of the tibia, grafts fixed by vitallium screws were his only successful cases.

Mr. ST. J. D. BUXTON (London) was not prepared to accept the view that the cause of non-union in fractures of the mid-shaft of the humerus was injury of the nutrient artery. This was not the only factor, for delayed or non-union did not follow ligature of the main vessel in an experimental fracture. Grafts must be made firm, by whatever means, though he had discarded the use of metal. He thought that the skeletal traction of a Thomas splint could cause non-union.

Mr. STIRLING, in reply, said the best time for operation, after every conservative method had been tried, was about 10 days after the injury. Then the collateral circulation was well established and embryonic tissue was proliferating. Massive crystallisation was a condition which often occurred in fractures of the shaft of the femur, when in elevation in the presence of abundance of vitamins and minerals union was not firm. On lowering the limb to the bed the fragments joined securely within 24 hours. Mr. NAUGHTON DUNN was not to be persuaded that there was any good in a Lane's plate. He had never used one and had seen many disasters following their use by others.

Open Fractures

Mr. W. C. GISSANE (London) said he would describe his treatment of the open fractures, occurring in a large city, for the most part from road accidents. There were blessings to be counted in the conditions of injury. The roads of a city were clean and often tarred; clothes were usually surgically clean—that is, they were free from pathogenic organisms; the instrument causing the injury was a shiny, petrol-driven vehicle; transport to hospital was speedy. In this way three dangers were avoided: delay, contamination from clothes, and contamination from the street dirt. All clothing was submitted to aerobic and anaerobic culture. A large number of non-virulent organisms was found. In the last hundred cases only one showed gas-gangrene and none tetanus. The usual pathogenic organisms were those found on the skin. The first step was excision of injured tissues; the living tissue left behind was able to cope with the remaining organisms. The next step was administration of anti-tetanus and anti-gas-gangrene serum. In a series of a hundred consecutive cases the sites of fractures were as follows: tibia and fibula, 43; skull, 11; radius and ulna, 7; phalanges, 6; multiple long bones, 5; femur, 5;

mandible, 5; nasal bones, 5; ankle, 5; humerus, 3; metacarpals, metatarsals, pelvis, malar and superior maxilla together, 6. There were 82 males and 18 females: 76 cases occurred between the ages of 5 and 45 years. Cases came in after first-aid treatment had been applied and the fracture immobilised. Shock was present. The first principle was to disturb the patient as little as possible. Shock was treated with rest, heat and a large dose of morphia. The patient was not washed, the splint was not interfered with and intravenous saline was not given. The wound was covered, the temporary splint was left intact and treatment begun within an hour. The main thing was to render the injury painless, for example by local anæsthetic. Before operation no washing or shaving was done, the skin was covered with spirit-soaked gauze and the wound uncovered. Mr. Gissane's faith in excision of wounded tissues and removal of dirt and tissue debris had superseded his faith in antiseptics. Leriche had said that the large-scale experiment of 1914–18 had demonstrated the failure of antiseptics. What was important was the vital quality of the tissues remaining. Often there was tearing of the skin and subcutaneous tissue to form a flap from the ankle to the popliteal space. It was best to sacrifice the flap and repair the area with immediate grafts. In ten such cases in a year, where previously amputation would have been performed, complete recovery had taken place. Fractures into joints might occur or open fractures with deep wounds. In both such, the treatment was excision and washing out with gallons of isotonic saline. Bone must be treated more gently. Débridement was confined to gentle elevation and the minimum of manipulation. After reduction by apposition and traction the wound was closed by a split skin graft. After closure, traction was maintained, the wound was cleansed by surgical spirit and immobilisation was insured by plaster-of-paris and the double-transfixion-pin technique. After débridement the soft tissues received blood but the return circulation was not completely established. Thus the tissues would not die on account of anæmia, but œdema always occurred. To prevent it, it was necessary to apply pressure. This was most evenly done by a wool-and-paraffin dressing. The first plaster was kept on for 4 or 5 weeks if the temperature or pulse charts gave no indication for removing it. Then the plaster was changed and a closed healing fracture was usually present.

Treatment was summarised in seven stages: shock; direct surgery without antiseptics; gentle reduction of the fracture; closure by skin graft or closely applied interrupted sutures; application of a soft paraffin dressing; immobilisation by plaster for 4 to 5 weeks; rest for 4 to 5 weeks.

Mr. G. H. STEVENSON (Glasgow) said that in first-aid the first dressing should be very large. First-aid splinting was often well done but too localised. It was a good rule to immobilise the joint above and the joint below the injury. He often had to cope with the long delay after fracture caused by air-transport from the Hebrides. Unlike Mr. Gissane he did not interfere with the usual washing and cleansing. He preferred a general anæsthetic to a local one, gas and oxygen or cyclopropane and oxygen for choice. He had not found that the experimental results of spinal anæsthesia of O'Shaughnessy and Slome were always proved in practice. He cleansed and shaved the skin, cleansed the wound with weak flavine or Dettol and then proceeded to débridement. He did not believe it was possible to excise the whole of the torn area. For closure of the wound he believed in Rutherford Morison's preparation "bipped silk," and the stitches should include skin and subcutaneous fascia only. The Thomas splint as often as not was used for applying traction. A useful sling for the limb could be made by splitting the inner tube of a motor tyre lengthwise; the calf of the leg rested nicely in the curve of the tube. In multiple open fractures it might be better to sacrifice the limb rather than the life.

Mr. ZACHARY COPE (London) said asepsis was not always the best kind of surgery in open injuries. In cases which came from a distance, the type of wound must decide the type of surgery. In a bullet wound when penetration was from without inwards, the organisms present came from outside; antiseptics alone would then be of no use. In a fracture, when penetration was from within outwards, no organisms would be present. Lister had shown that antiseptics were then of value in preventing infection. Débridement of course could be employed here to deal with the damaged tissue.

Mr. E. T. C. MILLIGAN (London) said he was greatly encouraged by Mr. Gissane's fresh exposition of the excision technique. During the war spinal anæsthesia was prohibited for the treatment of shock. It was of most use in cases where much fluid had not been lost. The blood-pressure was then used as an index. In those days, a pressure of under 120 was a contra-indication to spinal anæsthesia, but nowadays it was employed if the pressure was as low as 90. Most of the credit given either to asepsis or antisepsis was due to the excision of wounds carried out at the same time.

Mr. A. H. MCINDOE (London) said that coöperation between the surgeon and plastic-surgeon was to be desired, for not everyone could cut as large a graft as Mr. Gissane. Special centres for grafting and other plastic operations would be necessary during an emergency.

Mr. R. I. STIRLING (Edinburgh) said that the old method of débridement could be modified in severe wounds by swabbing with 1 per cent. crystal-violet and brilliant-green. Devitalised tissue showed up black and healthy tissue blue and thus selective excision could be done.

Dr. P. D. WILSON (New York) felt that there was always a danger in suturing compound wounds, for although culture in the first few hours might be sterile, organisms might develop later. He seldom had confidence to close them. The experience of surgeons engaged in the Spanish war and in China led them to favour Winnett Orr's method of treatment. This consisted of excision, application of a paraffin pack and immobilisation in plaster for a long period. Extension of military surgery must be founded on civil experience and he was sure that in an emergency we should be forced to leave wounds open. Traction splints were used by all the emergency services in America and therefore most of the fractures arrived in hospital in these splints, in much better condition than previously, and less shock was present.

Mr. GISSANE, replying, said that he had a team three strong to deal with multiple fractures and they did pretty radical excision. He had had to rediscover the value of leaving viable tissue, and then had discarded the use of antiseptics. Some antiseptics were actually injurious. Wounds to be skin-grafted could be left open after excision of devitalised skin, covered in plaster for 4 to 5 weeks, and then a skin graft was applied over the muscle after clearing away the granulations.

SECTIONS OF ANATOMY AND ANTHROPOLOGY

Prof. ALEXANDER LOW (Aberdeen) was in the chair when Prof. H. A. HARRIS (Cambridge) opened a discussion on

Anatomy and Physical Training

During growth, he said, particular attention must be paid to the spine; whereas at any joint there is not only bone but also articular cartilage, epiphysial growth cartilage and calcified cartilage; here in addition there are the complex intervertebral disks with their own physical properties and rates of growth. In man there is more growth in the lumbar region that in the cervical or thoracic spine, and in the lumbar region the disks are thickest and the spine most freely movable. Mobility of the spine is a property of the disks, in which the nucleus pulposus, set in a fibrous shock-absorbing ring, exercises a ball-bearing function. The main differences between the spines of men and quadrupeds are the overgrowths of the disks and lumbar spine (both vertebræ and disks) and the substitution of thin annular epiphyses for the truly "epiphysial" plates of other animals. These washer-like rings begin to ossify about puberty, so that then there is a change in the physical properties of the vertebral column. At this age, therefore, the liability of injury to the disks is greater in severe bending exercises, such as touching the toes. The rough-and-tumble of ball games is therefore less dangerous than squad drill. The frequency with which a disk is injured varies with its thickness. Similar principles should be applied to the limbs. Union of the epiphyses at the shoulder should alone determine the time at which heavy manual labour is started. Disease and deformity are quite as liable to occur in the hip-bone as in the head of the femur.

It was folly to cast horoscopes on the basis of imaginary relations between physical development, mental development, temperament and susceptibility to particular diseases. There was a low correlation between intelligence and physical efficiency. While no two children progressed towards maturity at the same pace, yet natural forces had a way of reducing the differences to some extent as maturity was approached. A distinction must be drawn between posture and attitude. Posture is a nervous mechanism of ancient heritage, modified in man by the acquirement of stereoscopic vision, and dominated by the righting reflexes, which are physiological and developed at an early age. Posture is automatic and involves the minimum of mental and physical fatigue. Attitude, on the other hand, is a position of preparation for action and consequently places a considerable strain on the individual. Much of physical drill is directed towards the acquirement of an attitude rather than the maintenance of a pose. In assessing posture it must be remembered that military smartness has no anatomical or physiological basis and that physical training is not regimentation. It is impossible and unnecessary to make all children conform to a standard developmental pattern or a standard of physical performance in terms of age, whether that age is calculated by the calendar or by mental tests. Above all, physical training should not attempt to interfere with the body-build. Food, play and free unorganised games in early childhood are the basis of healthy growth and physical training. There is no index of physical fitness or efficiency save the ability to do one's job and live to a ripe old age. The establishment of a false index will only produce inferiority complexes.

Dr. E. SOLLY (Harrogate) opened the discussion which followed. Prof. D. J. WATERSTON (St. Andrews) pointed out that though a man may carry out an action satisfactorily, still he may not do it in the best possible way; we should not lose sight of the fact that the best way can be taught. Many people, slouching about the streets, could do with a lesson in deportment.

Prof. R. D. LOCKHART (Aberdeen) questioned whether those responsible for physical training are so much in the dark about the dangers of regimentation and of certain exercises. Muscles were very important; the tension of the hamstrings imposes restrictions on the combined movements of the hip- and knee-joints, within any restriction imposed by the actual structure of the joints.

Professor HARRIS, in reply, admitted the psychological effect of any form of training, but believed that the carriage of most people was satisfactory, and that slovenly dress must not be mistaken for bad posture. There was a great discrepancy between physical build and physical prowess.

Dr. J. K. SLATER (Edinburgh) discussed the

FITNESS OF THE STUDENT

By a voluntary scheme, he said, all students at Edinburgh University could be medically examined; the numbers presenting themselves for examination and re-examination had steadily increased as the students appreciated the benefits of the scheme. It was very difficult to establish a standard when there was no specific object to be attained by that standard, in contradistinction to the insurance companies' standards of health. Among the students he had divided posture into three grades, of which the third —bad—included all definite deformities. On the whole posture was good, but there was a remarkable prevalence of flat-feet. It seemed probable that the likeliest way of establishing a life prognosis would be found in the investigation of the circulatory system.

Professor HARRIS said he would like to see X-ray examinations carried out on all students, and suggested that the incidence of pulmonary tuberculosis was very high in medical students. The results should be followed up after the students had left the university. Professor LOW and Mr. G. A. G. MITCHELL (Aberdeen) queried the prevalence of tuberculosis in medical students at Aberdeen.

In reply Dr. SLATER stated that the commonest causes of ill health among students were, in order, pulmonary tuberculosis, venereal disease, and gastric complaints. A diploma of physical education was now given at Edinburgh and was open to all students.

Professor LOCKHART showed a cinematograph film he had taken at the Bergman-Österberg physical training college, Dartford. A series of exercises was performed by an expert and a learner and the differences pointed out. Special attention was drawn to one in which the arms were elevated without movement of the clavicle. The trained student could achieve this, but not the learner, who could not allow her muscles to relax sufficiently.

Prof. A. LOW then spoke on

GROWTH OF ABERDEEN INFANTS

At the Aberdeen Maternity Hospital, he said, 1000 infants had been examined, and then re-examined at the child-welfare centre. Of 50 male and 50 female children who were fit, normal, and full-time, the boys at birth averaged in height 19·7 in. and in weight 7·7 lb., while the girls were a fifth of an inch and a tenth of a pound less. These heights were less

than the figures generally given, but the weights were five to six ounces greater than the published figures for other towns. Re-examination showed that the girls grew slightly faster than the boys and that in two to three years the figures are comparable for both sexes; by five the girls were slightly taller. For both sexes the figures were now higher than those for the five-year-olds of Dundee and Edinburgh. The pre-school years were very important. The working-class mothers of Aberdeen had shown great intelligence and appreciation of the work. There was urgent need in this country of reliable observations on the growth of the child, as there was an entire absence of continuous figures on the development of individual children. We had no reliable British growth statistics.

Professor HARRIS agreed about the serious gaps and considered the expenditure on school medical services unremunerative because of the loss at the two ends. Records should also be kept of the development of teeth, and of defects in sight and hearing. We knew more of the continuity of development of a laboratory rat than of a human being.

Professor LOCKHART, who had taken the chair, said that he believed that this was the first time in any country that such figures had become available, and, in reply, Dr. LOW remarked on the appearance of two developmental types, a precocious type which developed rapidly but by fits and starts, and a slower but more steady type. These resulted in two kinds of infant face, one long, "like his father," the other chubbier, "like his mother."

REVIEWS AND NOTICES OF BOOKS

Fractures and Dislocations in General Practice

Lewis's General Practice Series. By JOHN B. HOSFORD, M.S. Lond., F.R.C.S., assistant surgeon to St. Bartholomew's Hospital. London: H. K. Lewis and Co. 1939. Pp. 274. 12*s.* 6*d.*

Experience in the Management of Fractures and Dislocations

By the Staff of the Fracture Service, Massachusetts General Hospital, Boston. General editor, PHILIP D. WILSON, clinical professor of orthopædic surgery, Columbia University. London: J. B. Lippincott Company. 1938. Pp. 1036. 65*s.*

A Manual of Fractures and Dislocations

By BARBARA BARTLETT STIMSON, A.B., M.D., Med.Sc.D., F.A.C.S., associate in the College of Physicians and Surgeons, Columbia University, New York City. London: Henry Kimpton. 1939. Pp. 214. 12*s.* 6*d.*

BOOKS on the treatment of fractures follow one another so rapidly that one is left wondering whether most of them attain any but a purely local public. No branch of surgery in recent years has given rise to greater enthusiasm in those who practise it. At the present time many doctors are asking to be taught about the treatment of injuries who, until warnings of crisis and emergency disturbed them, had thought not to be drawn into traumatic surgery. Mr. Hosford's should be an excellent textbook for them. It is very well-balanced, containing detailed information about all the common fractures and dislocations but omitting descriptions of operations and rarer injuries which concern only the orthopædic specialist. The application of plaster splints has a chapter to itself, and it is probable that no better account can be read anywhere. The methods advocated for the various fractures are, of course, those used by the author. They are clearly set out and convincingly explained. This is the first textbook, to our knowledge, which has described clearly the four methods of using the Thomas splint for continuous traction. Skeleton splints, rather than plaster-of-paris, are recommended for the treatment of compound fractures, until a stage when the wounds have either healed or shown evidence of obvious infection. For infected fractures, the Winnett Orr technique is described.

The volume produced by the surgeons of the Massachusetts General Hospital is primarily an account of their own experience in fracture treatment. It is a complete clinical and statistical account of 4390 fractures and dislocations, good results and bad being impartially related. At the end of each section on any type of injury, methods and results are criticised. Each section is written by a different surgeon, and as there are thirty-four sections in all, one cannot but be impressed by the wealth of surgical personnel which the fracture practice of the hospital commands. The book is very interesting to the specialist, but it is not of value to the seeker after first principles or solutions of individual problems. It contains much useful and practical information, but surgeons as a rule do not like the statistical approach. Open treatment of compound fractures is advocated, by the Carrel-Dakin method. No case of gas-gangrene is recorded, although anti-gas-gangrene serum was not used at all. Dr. Charles Scudder makes a strong plea for more frequent use of open operative methods, especially in the case of long bones. In head injuries he says the tendency should be to operate less. The text is uneven in quality.

Dr. Stimson's manual is intended for medical students. The correct and incorrect ways of taking the history of an injury are described, and throughout the text and the illustrations are designed to appeal to the beginner. The summary given of the points of importance in each fracture is an aid to memory, as is also the description of each injury under uniform headings—occurrence, displacement, diagnosis, pathology, treatment, period of immobilisation and prognosis. This is a less ambitious book than either of the other two, but useful for the reader who still has to face a qualifying examination. The illustrations are throughout line-drawings, which in most cases seem unnecessarily heavy and rather inelegant. There is something in Mr. Hosford's contention that, since one has in practice to interpret not diagrams but original skiagrams, these are more suitable as illustrations for textbooks on fractures.

A Textbook of Surgery

By American Authors. (2nd ed.) Edited by FREDERICK CHRISTOPHER, B.S., M.D., F.A.C.S., associate professor of surgery at Northwestern University medical school; chief surgeon, Evanston (Illinois) Hospital. London: W. B. Saunders Company. 1939. Pp. 1695. 42*s.*

IN this textbook of surgery collaboration has been brought to its highest pitch, in that 183 living and 4 dead authors have contributed to its pages. Included in these are the best-known names in American surgery, and each subject is dealt with by an acknowledged master. The balance of the book however has been perfectly preserved, and its editor deserves the highest praise for the way in which proportion

has been maintained between the various subjects. He has driven such a distinguished and no doubt high-spirited team with the greatest skill. The result is a textbook which is authoritative, completely up to date, and the result of observation and experience, rather than of quotation or impression.

It is difficult to pick out the best in this book; perhaps the chapter on the nervous system, particularly the sections on tumours of the brain by Max M. Peet and on head injuries by Carl Wheeler Rand, stands out. Fractures are admirably dealt with, as are the various aspects of abdominal surgery. In the genito-urinary section, prostatic enlargement receives poor attention, and while the American preference for perineal prostatectomy is mentioned, no description of either this operation or of any of the suprapubic operations, is given. Chest surgery, orthopædics, gynæcology, and plastic surgery are all given ample space. It is pleasant to find such a wealth of material in excellent print, with a minimum of small type. There are 1381 illustrations, well produced and apposite, but it seems curious that the chapter on diagnostic and therapeutic radiology in surgery by James T. Case should be without illustrations.

Dr. Christopher has proved that multiple collaboration need not lead to prolixity, his contributors have shown that the expert is the best person to summarise his subject, and the publishers have given most satisfactory form to a book which is bound to achieve widespread and well deserved popularity.

Essential Nature and Organisation of Food Energy

By M. BIRCHER-BENNER, M.D. London: John Bale, Sons and Co. 1939. Pp. 89. 5*s*.

THE late Dr. Bircher-Benner made a considerable name for himself, even among orthodox physicians, by his dietetic treatment of various diseases, including tuberculosis, using uncooked fruits and vegetables exclusively. The present book is an attempt to justify his principles by arguments from modern physics, modern biochemistry and the second law of thermodynamics, and the attempt seems hardly worth while. The book might be reduced to the following statement: uncooked and unaltered vegetable foods have more activated molecules than animal foods; these can emit quanta of energy which can be utilised by the animal eating them; cooking and passage through the tissues of animals reduces this available energy; therefore animal foods and cooked vegetable foods are less valuable in nutrition than raw and uncooked vegetable foods.

The rest of the book contains little but dogmatic assertions, intricate assemblies of quotations from physicists from Carnot to Eddington and questionable deductions from these writers' works. It will probably convince no-one but the advocates of extreme vegetarianism, for it bears the stigmata of fanaticism. The author himself writes:—

"I foresee great resistance and many refutations to the new doctrine, which will be challenged also on account of its novelty. To conceive food energy as systems of light quants is revolutionary enough. Still more unheard of is the conception of a specially schemed organisation of energy in every nutriment, which I termed food integral. If I go so far as to assert that with food we introduce energy into our body corresponding to the body's structure which is adequately organised, or disorganised or transformed, some physiologists will immediately arise and explain that it is all nonsense, that in the process of resorption of food the digestive-fermentative action destroys the energy organisation."

The book will do little to remove or overcome resistance to these doctrines. There are many mistranslations—quant and quants for quantum and quanta, catalyzators for catalysts, denaturalising for denaturing, and so on. A far better monument to Dr. Bircher-Benner's fame would be a collection of his case-histories and methods of dietetic treatment, for his reputation can hardly have been raised upon such a sandy foundation as this book suggests.

Lumley's Public Health

(11th ed.) By ERSKINE SIMES, M.A., barrister-at-law of the Inner Temple; CHARLES E. SCHOLEFIELD, barrister-at-law of the Middle Temple; and A. N. C. SHELLEY, M.A., B.C.L., barrister-at-law of Lincoln's Inn. London: Butterworth and Co., and Shaw and Sons. 1939. To be published in 4 vols., £16 16*s*. Vol. II. Pp. 2644.

OVER a century ago a speaker in the House of Lords complained that Parliament had been passing statutes by wagon-loads and repealing them by cart-loads. If we think in terms of lorry-loads today, the simile is confirmed by the monumental tomes of the new edition of Lumley's Public Health. The recently issued second volume, even bulkier than the first, to which we paid tribute two years ago, contains the acts on food and drugs (consolidated in 1938), housing, town-planning, restriction of ribbon development, superannuation of employees, and rating and valuation, not to mention the drainage of trade premises, hydrogen-cyanide fumigation, physical training and recreation, the various midwives acts, and certain parts of the Factories Act of 1937. The editors hope soon to issue the fourth volume of the new "Lumley," which will contain the appendices; the third may be delayed and may appear in two parts. They confess that the contents of this third volume are not yet settled. Nor is this surprising. They want their work to be comprehensive and complete. They may well feel inclined to wait and see if the consolidating and amending Water Undertakings Bill receives the royal assent in the autumn. And by that time it may be possible to guess the prospects of certain other legislation about health now just appearing above the horizon. The subscribers to this colossal 16-guinea edition must have faith in the wisdom of the editors. For the first time for thirty years the name of Sir Joshua Scholefield, K.C., is absent from the title-page of a volume of "Lumley." His former colleagues carry on competently the difficult task of expounding, annotating and collating the various branches of public-health law.

It is not merely the lorry-loads of statutes that matter. There are also trailer-loads of statutory rules and orders behind them. The interdependence of act and order is illustrated by the familiar section 6 of the Midwives Act of 1936 which prohibits unqualified persons from acting as maternity nurses for gain. Parliament does not like legislating ahead of the facts. It therefore enacted that this restriction should not take effect in any area until the Minister of Health was satisfied that the local authority has first provided an adequate domiciliary service of midwives there. The volume under review gives us the text of the section and some appropriate notes thereon but does not seem to give the terms or substance of the orders whereby the Minister has pressed the button for the operation of the section in, say, Birmingham or Somerset. Perhaps this information is reserved for a future appendix. Then again the

restriction in section 6 is not to apply to women certified by certain hospitals and other institutions to have been trained in obstetric nursing. The hospitals and institutions are those which the Minister names. A footnote by the editors refers to two orders, one of 1937 and another of 1938, whereby the Minister has specified certain hospitals and institutions. But the book went to press presumably too soon to include a reference to a second order of 1938 to the like effect, not to mention the three subsequent orders of 1939. To single out so small a point in so vast a publication is not to criticise the editors' work so much as to exemplify its difficulties. The new "Lumley" maintains the standard of its predecessors. No more need be said.

Diet and Ill-Health on the Gold Coast

Especially in its Forest Country. By F. M. PURCELL, M.D. Dubl., M.R.C.P.I., D.T.M., & H. Lond. London: H. K. Lewis and Co. 1939. Pp. 77. 7*s.* 6*d.*

THE author, a medical officer on the Gold Coast, having recognised the need for vision in dealing with ill health among the western Akim, has collected cases showing evidence of malnutrition. His book is divided into two sections. The first deals with the local dietary at Oda, the chief town, and in scattered villages in the forest areas, where the main industry is cocoa farming. The second section describes cases of malnutrition and related diseases, mostly amongst the children of these communities. Some tribes live on a staple diet of plantain, cocoyam and cassava, while those in the northern territories live mainly on millet and some meat. On the coast, fish supplements the diet. The importance of nutritional œdema and skin disorders in the diagnosis of malnutrition is stressed, and cases are described showing many features of the pellagra syndrome. Reasons are given for thinking that *akwashiokar* is a form of infantile pellagra. The interesting clinical material is well illustrated by numerous photographs. The author points out the difficulty of detecting subjective symptoms in primitive communities, for example the detection of impairment of vision among those who are illiterate. Such observations make his findings of value to those who deal with nutrition from a more academic standpoint. The book is also of great importance for those who are faced with administrative problems of ill health on the Gold Coast, since excellent suggestions are given for improving the dietary; thus green leafy vegetables might be widely used, since these are within the limited means of these communities.

Abnormal Speech

By E. J. BOOME, M.B. Birm., M.R.C.P., D.P.H., principal assistant medical officer, London County Council; and H. M. S. BAINES and D. G. HARRIES, speech therapists for day centres and mental hospitals of the council. London: Methuen and Co. 1939. Pp. 162. 6*s.*

UNTIL recent years the importance of speech defect had been overlooked, but during and after the Great War it was shown that stammer could be produced by prolonged mental strain. Consequently speech defect as a symptom of similar strains in civilian life became widely recognised by physicians. It was then a short step for the educationists to realise that speech defect in children might be the result of similar nervous stresses, and that successful treatment of the stammering child, not only made it easier for the child to learn, but often resulted in the removal of other accompanying nervous symptoms. There is now a rapidly growing speech-therapy organisation and several books on the results of this work have appeared in recent years. The volume under review is an interesting contribution to the subject and certain chapters can be specially commended, notably those on the difficult child, and the spoken word. There is an amusing appendix, taken from an American official publication on "Data of Child Development." There are two slight defects in the book; the authors have attempted to put too much into a small volume, and it is a series of separate papers rather than a coördinated review of the whole subject. This is a danger difficult to avoid when a number of writers have pooled their experiences. The book is nevertheless interesting, not only for its contents, but also for its disclosure of the extent to which work under the London County Council has proceeded.

Aids to Dermatology and Venereal Disease

(2nd ed.) By ROBERT M. B. MACKENNA, M.D. Camb., M.R.C.P., hon. dermatologist, Royal Liverpool United Hospital. London: Baillière, Tindall and Cox. 1939. Pp. 284. 4*s.* 6*d.*

THIS little book is more than an aid to dermatology; it is a miniature reference book, more complete than most small handbooks on the subject. All the common skin diseases are dealt with thoroughly and concisely and many rarer conditions are included. Forty-four pages are devoted to a very adequate description of the venereal diseases and their treatment. Such recent advances as the use of M. & B. 693 for gonorrhœa and the complications arising from this drug are included in this section. For its size the book is extremely readable, but of necessity there are no photographs. It can be strongly recommended to any practitioner who requires a small textbook on diseases of the skin.

Clinical Bacteriology

By F. A. KNOTT, M.D. Lond., M.R.C.P., D.P.H., director of the bacteriological department and lecturer in bacteriology, Guy's Hospital. London: J. and A. Churchill. 1939. Pp. 426. 12*s.* 6*d.*

IN this book an attempt has been made to present bacteriology in its application to clinical work. Detailed descriptions of technique and cultural reactions of bacteria have, therefore, been cut down to a minimum. Nevertheless the clinical aspects are not more fully dealt with than in several other English textbooks of bacteriology, in spite of a short chapter on the management of infectious diseases and the mentioning of the clinical features of a few infections in the appropriate chapters. The presentation of the facts is simple, although in places the writing is rather confused as in the sections on the structure of antigens and the rate of antibody production. In two tables (pp. 200 and 260) the data are at variance with the text. The statements on pp. 133 and 152 referring to the fermentation of inulin by bacteria of the streptococcus pneumococcus group are contradictory. *Clostridium chauvoei* is wrongly credited with the ætiological rôle in lamb dysentery and the author states that tularæmia is met with only in America whereas its occurrence in Asia and in several countries in Europe is well recognised. Most of the illustrations are adequate; a few, such as fig. 20, are not particularly instructive and might well have been omitted.

THE LANCET

LONDON: SATURDAY, AUGUST 19, 1939

FRACTURES A SPECIALTY

THE steady spread of specialisation in surgery is often deplored as a necessary evil: necessary because the advancement of science has made surgery far too big a subject to be mastered by one man; evil because it limits the variety in a surgeon's work and sometimes warps his perspective. To the patient, however, the word "specialist" signifies something not evil but good, and there is no doubt that specialisation in surgery almost always improves the patient's lot; which, after all, is what matters most. The rival arguments have been revived by the appearance last week of the report on rehabilitation after fractures, which we summarise on p. 446.

Should fractures be treated by the general surgeon in the general wards and outpatient department, or should they be segregated and treated from start to finish in a special department by an expert controlling a team of trained assistants? From the point of view of the injured man there is no question which alternative is the better. Under the old system any person sustaining a fracture serious enough for inpatient treatment is admitted under the surgeon who happens to be on duty at the time. This surgeon may have no special interest in fractures and will probably not see the case until a day or two later. The immediate treatment is probably undertaken by a registrar or house-surgeon and the patient then remains in the ward for a few weeks surrounded by the sick and perhaps the dying. During this time the visiting surgeon sees him and maybe makes some suggestions for modifying the treatment. In due course the man is discharged, probably to the massage department, where his treatment is taken up by someone who has never seen him before and who is entirely dependent on the house-surgeon's notes for information. Finally, when the patient is considered cured he is discharged, and may then have a further period of waiting until he starts work again. There are very obvious defects in such a system. Yet nobody will say that this account is unfair to the average general hospital.

Conditions are very different in a special fracture clinic. The patient receives his first treatment either at the hands of the experienced surgeon in charge or of an assistant trained in fracture technique. During his stay in the ward he remains constantly under the same expert supervision. He is surrounded by healthy men in various stages of recovery and the atmosphere is one of optimism and the will to recover. When he becomes an outpatient he remains under the supervision of the same surgeon, who by now knows him and his injury pretty well, and his progress to full functional recovery is uninterrupted. In due course he may start light work, but he is still under the supervision of the surgeon in charge of the clinic until he is back again at full work. Centralisation and continuity of control are the essentials of such a system and the secret of its effectiveness. Its success in practice is no less certain than its advantage in theory. Those who have seen BÖHLER'S clinic in Vienna will none of them doubt that this is the general system under which fractures should be treated, even though they may disagree with details of his method. Though it is hard to imagine BÖHLER'S clinic without BÖHLER, his enthusiasm, his energy, and his personal interest in every patient at every stage of his progress should be characteristic of the surgeon in charge of any fracture clinic. We may not go all the way with W. H. OGILVIE in saying that "personal care and enthusiasm count for more than actual technique in the treatment of fractures," but we must admit that personal care and enthusiasm are essentials in the chief of a fracture clinic—in addition to surgical ability and experience. If such a man is to give so much of his time and energy and abilities, what is to be his reward? On the present system of honorary appointments at voluntary hospitals his financial reward is less than nothing. Not only is his appointment honorary, but the amount of time he must spend at it will greatly reduce his opportunities for remunerative work elsewhere. Some modification of this system is obviously necessary and the interdepartmental committee favours the giving of a substantial honorarium to the surgeon in charge of a fracture service.

Unfortunately specialisation in the treatment of fractures will affect others besides the patient and the surgeon who specialises. In the first place the remaining general surgeons will be deprived of the profit and interest of treating fracture cases. But this has been the criticism every time a move has been made to divert one of the streams of surgery into the channel of the specialist, and it can only be said that if the specialist shows that he is able to do the job better than the general surgeon, then he should be allowed to do it. The student's point of view must also be considered; and on the whole he will benefit. In a few attendances he will see a great number and variety of cases at all stages of treatment and he will have the advantage of watching an expert treat fractures; the theoretical teaching will also presumably be better. But he will probably be burdened with an addition to his curriculum, for he must still do his six months' general surgical dressing; and he may find too that the expert team will not be able to offer him a place, so that he will not be able to "get his fingers into the business" which is such an important part of surgical training, and will have to be content with watching. This at any rate has been the result of specialisation in some other departments of surgery.

Finally one may consider whether a fracture service might be extended to include other allied

conditions. The orthopædic department is the obvious next-of-kin to the fracture service, and the two have much in common. In several English cities the surgeon in charge of the fracture service of a hospital is one of the orthopædic surgeons, and the arrangement seems to work fairly well. A rather different question is whether a fracture service should be extended to include all other types of injury and become a general traumatic service. Some conditions such as lacerations, sprains, and all injuries of the limbs are certainly suited to treatment in a fracture service, but others are obviously not suitable—for example, injuries of the head and abdomen which are obviously best treated by specialists in cranial and abdominal surgery. These lesser problems however will solve themselves once the major question is decided, Should specialised fracture services be established? We believe the answer is, emphatically, Yes.

NEUROSIS OR PSYCHOSIS?

Professor RYLE'S Croonian lectures, concluded in our present issue, remind us very forcibly of the close interrelation between mental disorder and bodily dysfunction. The psychiatrist is at times apt to forget the physiological consequences of emotion. On the other hand, the general physician tends inevitably to think in terms of the somatic manifestations of minor mental upsets. In the busy consulting-room there is seldom enough time to build up a complete picture of the mental life behind the spastic colon. If the physiologically minded physician can join hands with the psychiatrist we may hope to arrive at a balanced understanding of the visceral neuroses. Meanwhile, psychiatrists find themselves in a position of increasing complexity. As they examine the mental changes of their less severely ill patients, they are continually faced with the question of the difference between a neurosis and a psychosis.

Like socialism and malnutrition, neurosis is easy to talk about but hard to define. We can recognise only too well our neurotic patients and we can as a rule tell when we meet the legally insane. But the psychotic patient does not necessarily hear voices or see visions and the conduct of the neurotic may well cast doubts on his sanity. YELLOWLEES [1] puts the case for one school of thought clearly and concisely.

> "Neurotics, generally speaking, are made, not born. I believe it to be far otherwise with the psychoses, the causes of which are more deeply and mysteriously biological. Psychotics are born, not made."

Clinically YELLOWLEES says that the essential difference is the insight into the illness or lack of insight: "In spite of all kinds of exceptions, qualifications and modifications, I know of no better, and indeed of no other, means to judge whether we are dealing with a psychosis or a neurosis, than to apply this test of insight." In other words, the neurosis is a product of environment and the psychosis of heredity; the neurotic retains his insight and his touch with reality, while the psychotic does not.

But, on the basis of careful clinical observation of the so-called borderline cases, there is growing up another school of thought. This school finds that in the causation of the neuroses and the psychoses both heredity and environment play their part; the hysteric often has an abnormally psychopathic family history, while the gross endogenous depression may be precipitated by a family or business misfortune. Further, they say that the advanced hysteric is completely lacking in insight, while the early schizophrenic often has enough insight to realise the bizarre stupidity of his symptoms and to seek relief for them. The conclusions of this school have lately been stated thus by SYMONDS [2]:—

> "The distinction between a minor mental disorder (a neurosis) and a major mental disorder (a psychosis) is one of convenience. All the primary mental disorders are 'functional' nervous disorders, being without known pathology, or specific ætiology. At one end of the scale, however, there are patients whose mental disorder is of a degree which might cause them to be regarded as insane by conventional standards—for example those of a Justice of the Peace. It is convenient to have a separate medical term for these patients and they are called psychotic, all other degrees of mental disorder being neurotic. There are certain types of mental disorder which very rarely become psychotic—for example hysteria. The schizophrenic patient on the other hand often becomes psychotic at quite an early stage of the illness. Between these extremes lies the affective type of mental disorder which may be either of the neurotic degree (anxiety neurosis, neurotic depression) or the psychotic degree (manic-depressive psychosis).
>
> ". . . There is in my view no essential difference between a neurosis and a psychosis except that of degree. This is opposed to the opinion at one time widely held that a neurosis and a psychosis were two quite different diseases and of different ætiology, an opinion largely founded on the belief that all neuroses could be accounted for in terms of psychological conflict or motivation."

At once a difficulty presents itself. If the term psychosis be reserved for the legally insane, while neurosis covers the rest of mental illness, the early schizophrenic, as quoted by SYMONDS, is not psychotic but neurotic, while the rare but occasional certified hysteric is not neurotic but psychotic. Such reasoning leads inevitably to the conclusion of MAPOTHER and LEWIS [3]: "The distinction between neurosis and psychosis is at times convenient, but without substance." This does not mean that hysteria, the anxiety state, and the obsessional state are not definite diagnoses. It simply means that, although they do not as a rule require institutional treatment, they differ essentially from schizophrenia, paranoia and mania only as these differ from one another and not, say, as diseases of the skin differ from those of the liver.

To state dogmatically that either of these schools is correct would be premature. If the conception of the neuroses and the psychoses as two essential varieties of mental disorder is to die, it will probably die hard. While the battle rages, perhaps the safest place is the fence.

1. Yellowlees, H., Clinical Lectures on Psychological Medicine London, 1932.

2. Symonds, C. P., *Guy's Hosp. Gaz.* Aug. 12, 1939, p. 258.
3. Mapother, E., and Lewis, A., Price's Textbook of the Practice of Medicine (5th ed.), London, 1937.

CHILDREN AT THE PICTURES

NEARLY five million children in this country go to the cinema as a habit once a week; and many thousands go more often. "Children in the Cinema," [1] by RICHARD FORD, is therefore very welcome. Its findings are so objectively set out and its conclusions so free from bias that they deserve the consideration of all concerned with the healthy development of children. That the cinema influences the child's habits of speech nobody can seriously doubt who has heard a six-year-old patient reply "O.K. chief" to a request to put out his tongue. Does the film similarly influence behaviour? A speaker at the conference of the central women's advisory committee of the Conservative party, on May 11, 1938, is thus reported: "We all know that there is a very great increase in juvenile crime. . . . It is the considered opinion of those who know that this is very largely due to the effect of unsuitable films upon children." A magistrate, presiding over a juvenile court where a charge of shop-breaking was brought against three boys, said, "These lads go to the pictures and see dare-devil things, and they are imitating them. I have never been to the pictures in my life, although I am over seventy." On the other hand, at the child-welfare committee of the League of Nations the British representative said that the conclusion they had come to at the Home Office was that there was very little crime deliberately due to what the child had seen at the cinema. And the HOME SECRETARY expressed himself thus in the House of Commons: "Our inquiries go to show that today the young are not more wicked than they were, but that they are less controlled by their parents. . . . It is not so much films and shilling shockers that make juvenile crime, but broken homes, indulgent mothers, unkind stepmothers and unemployment." Child psychiatrists apparently agree with the Home Secretary. Dr. EMANUEL MILLER, speaking at a conference on films for children in 1936, said, "The films no more produce criminals than the amorality of our dreams induces us to commit crimes. I have not known a single young delinquent, of more than 100 I have studied, who was deeply influenced by films of crime. They may act the gangster, but they do not follow his career!" Prof. CYRIL BURT, in his book "The Young Delinquent," writes of cases in which the opening of a cinema had reduced hooliganism among boys, withdrawn young men from the public-house, and supplied girls with a safer substitute for lounging with their friends in the alleys or the park.

It seems that the usual reaction of the juvenile audience to a film is to identify itself with the sympathetic character, usually the hero or heroine. In one of the most popular types of film, the "Western" serial, the children identify themselves with the cowboy hero; they are not in the least shocked or horrified by the innumerable sudden deaths that occur provided their hero escapes unscathed. Right triumphs over wrong, and right can always be identified in the dustiest mêlée by his big white hat. This process of self-identification explains, too, the success of the child star. In slapstick comedy the child appears to play the part purely of a spectator, though usually a highly appreciative one. Of the cartoon films, the purely comic variety, including most of the adventures of Mickey Mouse and Donald Duck, are extremely popular. But some of the more fantastic Disney cartoons, in which grotesque animals and bogy-men take part, are really terrifying. Mr. FORD reports that 923 elementary-school children in Birkenhead were asked whether the pictures ever frightened them, and the replies were: no, 465; yes, 148; sometimes, 298. Most authorities consider that fear in a children's audience is highly undesirable, and this was given official recognition by the censors' introduction of the Horrific category—"H" films. It is difficult to foresee what is likely to frighten young children. They appear to demand a stable order of things and any threat to this order is violently resented. Broadly speaking, one may say that, if the film contains a character with which the child identifies himself, any gruesome or painful thing happening to this character will cause distress. This must not be confused with the excitement and even creeping of the flesh, which is usually entirely pleasurable, occasioned by the thrills of the "Western" serials and the gangsters. In the grotesque Disney cartoons, and in films with villainous characters, a close-up, or worse still an ugly face gradually enlarged to give the illusion of approaching the spectator, will produce the silence of real fear. Indeed this gradual enlargement of objects is the essential feature of many nightmares. The supernatural is also apparently acutely unpleasant to the child; of 1439 children studied by the Birmingham Cinema Enquiry Committee,[2] 350 admitted that their sleep was disturbed by fear or bad dreams. It is interesting, but not surprising, to find all observers agreed on the harmlessness to child audiences of prurient or erotically suggestive passages. Love, and those substitutes which the cinema is so prone to portray, are considered by children as incomprehensible and profoundly boring. Only to the adolescent and the ill-educated adult are they possibly depraving.

Efforts are now being made to select, from the general commercial output of the film industry, films suitable for children, and to show these films at special performances. But on the constructive side of making special films for children, whether for entertainment or education, the industry has not made much progress. Many of the difficulties have been financial, but public ignorance and apathy are the real hindrances to progress. The medical and teaching professions are generally unaware of the very important place which the films are taking as a formative influence on the ordinary child's mind. The direction of this influence into channels of a higher cultural value is a matter of importance and urgency.

1. Children in the Cinema. By Richard Ford. London: George Allen and Unwin. 7s. 6d.

2. *Lancet*, 1931, **1**, 1409.

ANNOTATIONS

THE PREVENTION OF FIBROIDS

ON p. 420 Professor Lipschütz and Dr. Vargas record experiments supplementing those they described in our issue of June 10. They then showed that fibromyomas of the uterus can be produced in castrated guineapigs by the continued administration of œstrogenic hormones. In commenting on their findings we expressed the view that the appearance of these tumours might be prevented by the simultaneous administration of hormones known to be physiological antagonists to œstrogens, such as the luteal hormone of the ovary (progesterone), or the thyrotrophic hormone of the anterior pituitary. This possibility has been recognised also by Lipschütz and Vargas, and the results reported in their present paper fulfil the prediction as regards progesterone. The new observations explain why fibroids can be induced with œstrin more easily and regularly in the castrated animal than in the intact one. They also give further support to the view that fibroids in human beings arise through a disturbance of endocrine balance—a conception in accordance with the clinical features of the disease in women. A rational treatment based on this conception, making use of either progesterone or the thyrotrophic hormone, appears therefore a possibility, and one which might now be justifiably explored by clinicians called upon to treat small fibroids.

This work raises too a question of general pathological interest—can uterine fibromyomas still be classed with the true tumours? Hitherto they have been regarded as benign tumours; but true tumours, whether benign or malignant, have the property of autonomous growth—i.e., they continue to grow when the stimulus that has led to their appearance is withdrawn. Experimentally these uterine fibromyomas regress when administration of œstrogenic hormone ceases, and this absence of autonomous growth constitutes a difference which justifies their separation, as non-neoplastic tumours, from the true benign neoplasms. It is possible that further investigation of the causation of other types of tumours now believed to be benign neoplasms may add other examples to this group of non-neoplastic tumours. The importance of drawing such a distinction, if it exists, need not be emphasised. Not only is it of theoretical interest but it is bound to influence treatment.

THYROTOXICOSIS, INFECTION AND THE HEART

MANY workers believe that the streptococcus has something to do with rheumatic fever, but that there is another undiscovered ætiological factor which operates in conjunction with it. Some have sought this missing link among the filtrable viruses, others in an altered functional state of the tissues of the rheumatic patient. There is evidence in support of a hereditary abnormality, possibly in the form of an altered serological response to streptococcal infection. The suggestion that vitamin-C lack prepares the soil so that rheumatic fever is produced by streptococcal infection is out of favour now, but the work on which this hypothesis was based did at least point the way to the experimental study of myocardial damage. Now interest is turning towards endocrines. Schultz [1] finds that repeated injections of adrenaline produce minor lesions in the hearts of guineapigs, but that streptococcal infection does not intensify the damage. Infection is important in causing non-purulent myocarditis in animals treated with insulin or thyroxine. The results with thyroxine are particularly interesting because of the tendency for Graves's disease and rheumatic fever to occur in the same individual. However the changes in the animals' hearts did not resemble at all closely those seen in rheumatic fever. The serous myocarditis and myocardial fibrosis which were produced were like the lesions seen in exophthalmic goitre, and suggest that infection occurring in this disease may cause permanent damage to the heart. The way these experiments worked is obscure. Studies with endocrines, dinitrophenol, vitamin C, and ultraviolet irradiation suggest that increased metabolic rate and cardiac overwork are not alone responsible. Thyroxine caused a slight increase in the rate of antibody formation but the relationship between this and carditis was uncertain.

1. Schultz, M. P., *Publ. Hlth Rep., Wash.* July 7, 1939, p. 1205.

"DORMANT" LEAD POISONING

THE Manchester inquest on a painter, reported in our columns last week under the heading "Lead lying dormant?" ended in the jury returning a verdict of accidental death due to the man's occupation. While it is a valuable function of the coroner's court to draw attention to the dangers connected with industrial employment, the 1936 report of the departmental committee on coroners deprecated the tendentious verdict which may seem to trespass into the field of civil liability and, in cases where the application of the Workmen's Compensation Act may ultimately be an issue, to anticipate the decision and to interfere with the jurisdiction of the county-court judge by whom that particular issue will be tried. The verdict of the coroner's jury is in no way binding upon the county court.

Whatever the appropriate tribunal, the parties possibly concerned with the aspects of civil liability may be left to seek decision there. It may perhaps be permissible to add, without particular reference to the facts of the Manchester case and certainly without any intention to prejudge any litigation, some general observations on lead poisoning. This form of industrial disease has in the past been accused of causing various conditions now known to have no connexion with it—illnesses ranging from disseminated sclerosis and paralysis agitans to general paralysis of the insane and lymphocytic meningitis. In any investigation of causes, special attention must be devoted both to the clinical picture and to the occupational history. Possible sources such as drinking-water will naturally not be neglected. The available material would include the methods and habits peculiar to the patient—points perhaps unknown to a workman's employers. Suppose, for instance, that a post-mortem examination of a middle-aged workman reveals no lesions other than a terminal bronchopneumonia but discloses comparatively large quantities of lead in the liver, kidneys and brain, although evidence at the inquest negatives any history of exposure to lead for many years past. With these indications of a high circulating lead, what would be the likelihood that lead absorbed many years ago could have been mobilised in sufficient quantity to cause lead encephalopathy? On the one hand Aub and his co-workers showed, many years ago, that lead could be drawn into the circulation from the bones by influencing the direction of calcium flow.

On the other hand, it is now believed that this mobilisable lead is stored in the bone trabeculæ, and that, when absorption ceases, part of it slowly passes to the blood, from which it is excreted, and part passes to the hard bone where it is much less easily affected by changes in the body fluids. Toxic episodes can be precipitated by various means for a short period after absorption; but is there any evidence that lead can be mobilised in sufficient quantities to cause characteristic symptoms after a lapse of many years? Will those concerned with industrial lead poisoning support the interpretation Dr. Gordon Ward places on the facts he reports in our correspondence columns this week?

THE RHEUMATIC NODULE

RHEUMATIC subcutaneous nodules were described early in the nineteenth century, were studied microscopically over fifty years ago, and are still the subject of mild controversy. Meynet in 1875 thought them extremely rare, whereas Cheadle in 1889 found them common in children. Coburn in 1931 recorded them in 11 per cent. of his patients,[1] while Wilson,[2] observing cases in the same city over a longer period, found them in as many as a third. Their specificity is not often questioned, but the nodules of rheumatoid arthritis resemble them clinically, and the microscopical appearances are similar, although Collins[3] thinks them not identical. Carey Coombs in 1924 wrote that the subcutaneous node was the most rheumatic of the rheumatic phenomena, but admitted seeing it in subacute rheumatoid arthritis and in a case of chronic ulcerative carditis. (However, coincidence of the cardiac lesions of bacterial endocarditis and Aschoff's nodes has been demonstrated many times, and Coombs's patient may have had both diseases.) Carpenter in 1901 reported nodules in infants with no other sign of rheumatism; but if rheumatoid arthritis is excluded it is fairly safe to regard typical nodules as diagnostic of rheumatic fever, and the old working rule that they signify cardiac involvement and a severe infection is just. Cheadle regarded "the eruption of large nodules as almost equivalent to a sentence of death," and Coombs believed the "most serious omen as a form of onset is the subcutaneous node." Wilson[2] studied 20 rheumatic patients who were under regular observation in the first three decades of life and noted that 5 of them had nodules, none at the onset. Of 20 who died in this period, 8 had nodules, 2 of them at the onset. So nodules do not make the prognosis hopeless.

The experimental side is controversial too. Passing over the production of nodules in the rabbit by intravenous inoculation with the micrococci of Poynton and Payne in 1913, and in the guineapig by a combination of vitamin deficiency and streptococcal infection,[4] we have to consider the claims of Massell, Mote and Jones[5] to have produced nodules in man. They injected procaine and some of the patient's blood into the subcutaneous tissues over the olecranon process, and made each patient rub his injected elbow on the bed for several minutes, six times a day, for ten days. The experiments were well controlled, and 18 out of 20 children with clinical rheumatism developed nodules. The third issue of our new contemporary, *Annals of the Rheumatic Diseases*, contains an article by F. Dudley Hart[6] describing similar experiments, with completely negative results. The only differences between the methods were that Hart used no procaine, and friction was applied with the patient's hand "several times a day," and may not have been vigorously applied. We know of another experimenter who injected blood distal to the olecranon process, and told the child to rub the elbow on the bed; a moment's trial makes it clear that friction is thus applied over the proximal aspect of the olecranon process, and nodules subsequently appeared there, not where the blood was injected. The common sites for the natural formation of nodules are where a bony surface is exposed to the small irritation of the bed-clothes, and it is hard to think that friction or pressure is not a major factor.

Whatever may be the cause of the discrepant findings, we must await further investigation—in the faint hope that the differences will be resolved, but with a sanguine expectation of further disagreement.

THE YEARBOOK OF THE LEARNED WORLD

THIS invaluable publication, comprising the sections of Minerva[7] concerned with the universities and technical high-schools of the world, contains particulars of the staffs of all the seats of learning from Cambridge to Calcutta and from Simferopol to Santiago. Its completeness reflects the greatest credit on Dr. Gerhard Lüdtke, its editor, and on Dr. Friedrich Richter, his assistant. To both and to the publisher the learned world owes an ever-increasing debt.

URETERIC TRANSPLANTATION INTO THE INTESTINE

ANASTOMOSIS between the ureters and the large bowel is carried out in cases of congenital malformation of the bladder and as a preliminary to removal of the bladder for malignant disease. In view of the severity of the operation of total cystectomy it is most desirable that any method of deviating the urinary flow that precedes it should be simple, and for this reason there is much to be said for transplanting the ureters into the loin. Unfortunately, however, as Mr. Henry Wade[8] pointed out in his Honyman Gillespie lecture, no apparatus has yet been devised that will keep a patient dry when standing, sitting and lying, so that, in spite of its low mortality, this operation has largely been discarded. The risk of fatal ascending infection when the ureters were transplanted directly into the bowel was appalling, but this has largely been overcome since Coffey introduced his oblique submucous method of anastomosis. In these cases Wade now uses transplantation into the pelvic colon. Mayo has always carried out this operation in two stages, but Wade, employing a modified Coffey technique, transplants both ureters simultaneously. Important details in his procedure are that he dispenses with catheters to keep the anastomosis patent, that he administers continuous intravenous infusion of sodium sulphate for the first three or four days to keep up the urinary flow, and that he leaves a tube in the

1. Coburn, A. F., Infection in the Rheumatic State, Baltimore and London, 1931.
2. Wilson, M. G., *J. Pediat.* 1937, **10**, 456.
3. Collins, D. H., *J. Path. Bact.* 1937, **45**, 97.
4. Rinehart, J. F., Connor, C. L., and Mettier, S. R., *J. exp. Med.* 1934, **59**, 97.
5. Massell, B. F., Mote, J. R., and Jones, T. D., *J. clin. Invest.* 1937, **16**, 125.
6. Hart, F. D., *Ann. rheum. Dis.* 1939, **1**, 196 (official journal of the Empire Rheumatism Council; published by H. K. Lewis and Co., London).
7. Minerva: Jahrbuch der Gelehrten Welt. Berlin: Walter de Gruyter and Co. 1938. Vol. 1: Europa. Pp. 1320. RM.42. Vol. 2: Aussereuropa. Pp. 1029. RM.38.
8. Wade, H., *Edinb. med. J.* February, 1939, p. 61.

rectum to ensure the free escape of urine. Wade has carried out this operation in 54 cases, and in his more recent series has had only 1 death in 11 patients operated on for non-malignant conditions and 6 deaths out of 14 patients with carcinoma of the bladder. The operative risk of this procedure is therefore not prohibitive.

The second standard method of uretero-intestinal anastomosis is transplantation into the rectum, which was first carried out by Simon in 1851, and one type of which is described by Prof. Shilovtzeff on p. 412. In Shilovtzeff's series the operative mortality was high, for he had 5 deaths in his 19 non-malignant cases. As he says, however, ectopia, which was the condition present in 12 of these, is itself highly fatal, and he maintains that his operation presents few technical difficulties even in infants. Coffey's technique and its modifications have the disadvantage of being elaborate, and any simplification that does not entail greater risk is of value. The transplantation of both ureters at one operation, advocated by both Wade and Shilovtzeff, is also much to be desired, since separate transplantation in a case of carcinoma of the bladder may mean four operations—an exploration, two operations for transplantation, and a cystectomy. There are few patients who will tolerate such an ordeal.

OSLER UP TO DATE

Of the many writings of Sir William Osler, perhaps none has had so wide an appeal to all sorts and conditions of men as Aequanimitas.[1] Published in 1904 it has been republished many times since, and now thirty-five years since it first appeared it still has its message. Reading again these pages it is easy to understand the reason for this continued esteem. Almost every line is the credo of the most distinguished clinical teacher of his day, expressed in language which is not only full of literary and philosophical allusion, but is itself a notable example of the best English prose tradition. In one address he lays emphasis on the international unity and concord of the medical profession. In these days of political upheaval Osler would at least have had the consolation of finding that medical friendships and international medical interchange have endured in spite of differing state ideologies. No-one who is seeking to join, or already belongs to, the medical profession can find a more inspiring leader. Sir Walter Langdon-Brown contributes a brief and sympathetic note recording the impression which Osler made on those whose privilege it was to know him.

If Aequanimitas gives us an insight into the mind of the master as he himself wished it to be remembered, his bibliography,[2] laboriously compiled by Dr. Maude Abbott, shows him in a somewhat different light. He was a prolific and highly skilled journalist. He had an unerring eye for good copy, and tireless energy in putting it into shape. He was essentially a transmitter and a sublimator of knowledge rather than a pioneer in untilled fields. His output of writings, speeches, and discussions was enormous, and we are filled with admiration for the skill and completeness with which Dr. Abbott has presented the results of her toil. The arrangement of such varied material is obviously important, and she has divided it under seven chief heads—natural science; pathology, comparative and human; clinical medicine; literary, historical and biographical; medical education; public welfare; and editorial. The longer sections are subdivided into the four main periods of Osler's life: at McGill, at Philadelphia, at Baltimore and at Oxford. There is an excellent index, so that it needs no long search to discover any subject on which Osler made observation or reflection.

Dr. Abbott prefaces her work with three admirable quotations, one from Osler himself, one from John Ferguson's Bibliotheca Chemica, which Osler quoted in the transactions of the Bibliographical Society, and the third from Sir Humphry Rolleston's Osler memorial lecture: "So wide were his contributions that any writer, especially if with a new idea, observation, or historical subject, would be well-advised to find out before publication what Osler may have said." This volume makes the condition easy of attainment and all students of medicine and literature will be grateful to Dr. Abbott.

1. Aequanimitas: With Other Addresses. (3rd ed.) By Sir William Osler, Bart., M.D., F.R.S. With a biographical note by Sir Walter Langdon-Brown. London: H. K. Lewis and Co. 1939. Pp. 451. 7s. 6d.
2. Classified and Annotated Bibliography of Sir William Osler's Publications. (2nd ed.) Edited by Maude E. Abbott, B.A., M.D., LL.D. McGill. Montreal: The Medical Museum, McGill University. 1939. Pp. 163. $2.25.

SPITTING

Expectoration is so commonplace that its physiological significance and mechanism have been neglected. It should be a subject of special interest to workers in one of the new clinical research departments, as most of our knowledge has in the past been collected by clinicians. Just over ten years ago Cecil Wall[1] dealt fully with the musculoskeletal mechanism of expectoration. He described how, by raising intrapulmonary pressure and then suddenly allowing the air to escape, any peccant matter that might be lying in the air-passages was carried away. About the same time interest was revived in ciliary movement and its part in removing secretions. It was nearly a century since Sharpey[2] had shown that cilia worked together to move a sheet of mucus in a constant direction. For many years nothing further was added to this knowledge, until Leonard Hill[3] demonstrated that secretion and foreign particles are carried by the cilia to the larynx comparatively quickly, and that they work best in a neutral medium with the mucous membrane evenly stretched. As might be expected, the rate of motion is accelerated in the horizontal position when the influence of gravity is removed. Hilding[4] pointed out that the secretion in the nose and accessory sinuses is carried backwards by the cilia into the nasopharynx, a finding which was confirmed by Lucas and Douglas.[5] These workers went on to show[6] that neurogenic impulses in the bronchi and trachea affect the rate of secretion but not the rate of motion of the cilia. Thus the rate of evacuation of secretion (that is, the efficiency of ciliary propulsion) is a function of its consistency.

A mass of evidence therefore proves that throughout the bronchial tree a sheet of mucus is steadily being moved by ciliary action towards the larynx from the periphery. In addition, another sheet of secretion is being pushed towards the larynx from the upper air-passages by a similar method. Nasopharyngeal secretions are normally swallowed, but, though not expectoration in the literal sense, they may be hawked or coughed up in disease. Muscular action

1. Wall, C., *Lancet*, 1928, **2**, 957.
2. Todd's Cyclopædia of Anatomy and Physiology, London, 1835, vol. i, p. 606.
3. Hill, L., *Lancet*, 1928, **2**, 802.
4. Hilding, A., *Arch. Otolaryng.* 1932, **15**, 92.
5. Lucas, A. M., and Douglas, L. C., *Ibid*, 1934, **20**, 518.
6. Lucas and Douglas, *Ibid*, 1935, **21**, 285.

assists the progress of these two sheets of mucus. The thoracic movements described by Wall act as a gross method of propulsion, but there are, in addition, finer movements of expansion and contraction of the bronchi [7] occurring at each phase of the respiratory act. A bronchoconstrictor reflex also facilitates the expulsion of secretion. The most violent movement of expectoration is the cough which is reflexly excited when secretion in excess of normal reaches certain areas of the bronchial tree. These sensitive areas are chiefly the carina and larynx, but also to a lesser degree the larger bronchi and trachea. Chevalier Jackson has said that "the cough reflex is the watch-dog of the lungs," and certainly it is the most dramatic method of evacuation of unwanted material.

Thus secretion is removed from the lungs by a combination of four methods, and H. C. Ballon [8] has recently reviewed the mechanism. He also describes experiments which show that foreign bodies or secretion can be coughed out of a lung even when the diaphragm on that side is paralysed. Maxwell Ellis [9] had previously demonstrated that any change in capacity of the thoracic cage is synchronously accompanied by a change in the calibre of the bronchi, and that a lung can empty itself of secretion even in the presence of a pneumothorax. As a corollary, Ballon states that healthy lung is protected against secretions emptied into it from diseased pulmonary tissue by an increase in tone of its bronchial tubes. There is again experimental evidence to show that variations in bronchial tone occur not only as a result of stimuli but also in an apparently quiescent animal.[7] Pharyngeal movements assist the cilia of the upper respiratory tract in the propulsion of secretion, and, when secretion is excessive or irritant, the larynx is excited to produce the cough reflex. This occasionally gives rise to an erroneous diagnosis of pulmonary disease; for instance, "hæmoptysis" is often a manifestation, and sometimes the only one, of epistaxis. Further inquiry into this complicated and important bodily function is certain to produce results of great interest as well as of clinical value.

INDIA GOING DRY

IT is perhaps chiefly for emotional and religious reasons that Congress has adopted the prohibition of alcohol as a plank in its programme. Nine Indian provinces have now introduced prohibition in limited areas, and each has had to face considerable financial losses from excise revenue and the cost of preventing smuggling and illicit distilling. On Aug. 1 Bombay city went dry. The estimated drink bill was formerly 3 million pounds a year, of which half went to the government in excise. The drink trade was in the hands of the Parsees and the first day of prohibition was marred by riots between Hindus celebrating the end of an abuse and Parsee agitators protesting against the new property tax which is intended to bridge the deficit in the revenues. Eight hundred volunteer prohibition guards, among them students, doctors and lawyers, are helping to enforce the law, and 20,000 members of various physical and cultural organisations have also offered their services.

Bombay is introducing prohibition in an urban area, whereas other provinces have preferred to start in rural parts. For over a year the Madras government have been enforcing prohibition in a rural area centring around the town of Salem. Prof. P. J. Thomas, an economist at Madras University, regards the initial results as extremely encouraging.[1] Formerly the average annual drink bill among certain classes of Salem workers was 132*s.*; of the 2,500,000 total population not more than 200,000 took drink, but the liquor sales of the district exceeded an annual average of £2 a head. The first effect of prohibition on manual workers was apparently loss of energy and zest for hard work; aches and pains increased and absenteeism was common. Later, however, attendances rose from 63 per cent. to 91 per cent. and a monthly bonus of 3*s.* for regular attendance, previously earned by 10 per cent. of the workers, was earned by 75 per cent. Output also increased. All classes of workers consumed more vegetables, milk, ghee (melted butter) and curds. When Thomas wrote his report the cinemas in Salem had increased from four to six and their daily takings from £15 to £38. Expenditure on shoes, umbrellas, soaps and clothing had nearly doubled, and debt repayment had improved.

At the same time it would be unwise to say as yet that prohibition has proved itself in India. The large majority of Indians have been for many years total abstainers, and an open hostility to alcoholic beverages has almost confined intemperance to the lowest strata of society. It is arguable that the intemperate addict who has defied the deeply rooted age-long prejudice of the majority will not find solace in passively diverting his income to socially desirable expenditures. He may still waste his substance on gambling, ganja, opium, and other narcotics.

7. Ellis, M., *Lancet*, 1938, **1**, 819.
8. Ballon, H. C., *Amer. Rev. Tuberc.* July, 1939, p. 1.
9. Ellis, M., *J. Physiol.* 1936, **87**, 298.

Air Vice-Marshal Sir ALBERT RICHARDSON, director of medical services at the Air Ministry, has been promoted to the rank of Air-Marshal.

The seventh International Congress on Rheumatism will be held at New York, Philadelphia, and Boston from June 1 to 10, 1940. Further information may be had from the Ligue Internationale Contre Le Rhumatisme, Keizersgracht 489, Amsterdam, Holland.

The death is reported from Moscow of Prof. M. B. KROL, director of the clinic for nervous disorders at the All-Union Institute of Experimental Medicine. Born in 1879, Prof. Krol was chief physician at the Kremlin Hospital from 1934 to 1938, and in 1935 he headed the Soviet delegation to the second International Neurological Congress in London.

1. Thomas, P. J., A Survey of the Economic Results of Prohibition in the Salem District, Oct., 1937, to Sept., 1938. University of Madras. 1938.

"... The man of science has shown a sad lack of imagination in his nomenclature of the vitamins. The use of A, B, C, D, E, etc., conveys nothing to the man in the street, who cannot possibly be expected to memorize their functions. They might at least be given names which indicate that they are antiscorbutic or antiricketic or provirility or something else. Their appreciation by the public is being retarded by the inability to talk about them by appropriate names. Our literary friends must cease their smiles at our impotence and come to our assistance—a nation which finds names for its racehorses should not be defeated by a few vitamins."—E. F. ARMSTRONG, F.R.S., in his review of "The Englishman's Food" by Prof. J. C. Drummond and Anne Wilbraham, *Nature, Lond.* Aug. 12, 1939, p. 265.

SPECIAL ARTICLES

PUBLIC-SCHOOL AND SECONDARY-SCHOOL BOYS

A COMPARISON OF THEIR PHYSIQUE

BY H. BATHURST NORMAN, D.M. Oxfd, M.R.C.P.

IT is important to define standards of physical development which may be expected when the environment is optimum. Spence (1935) has emphasised the value of a knowledge of normal—i.e., optimum—standards of physique: "The time is ripe for a re-examination of standards of physique and growth and if necessary for the formulation of new standards which represent what are desirable and attainable levels of physical growth for the people of this country . . . it should be possible to know what stature may be hoped for in people if they are brought up under ideal nutritive conditions." Gray and Jacomb (1921) have compared certain of the current physical standards with actual observations of 136 healthy private-school boys from wealthy American homes in order to determine which of these standards is most suitable for use in connexion with this particular class. Their conclusion is that for judging the size and weight of children of the highest economic class totally new standards are necessary.

The years of adolescence are a critical period from the nutritive standpoint. A time of rapid growth is associated with the physical and emotional adjustments of puberty and educational tests or long hours of unaccustomed work have to be faced for the first time. But the state of nutrition at this period has been less fully investigated than amongst children of school age, and in particular there is a lack of standards based on recorded measurements of groups of adolescents whose home environment, health record and heritage present a favourable combination.

The material of the present investigation comprises 1001 adolescent males between the ages of thirteen and eighteen years. Of these, 500 are public-school boys drawn from that 10 per cent. of the population which is comprised in the nutritional group VI of Sir John Orr (1936). In this group alone the standard requirements of the various nutritive elements for the maintenance of perfect health are exceeded in every instance. The remainder are a homogeneous group of secondary-school boys in the county of Durham. The following measurements are recorded for each group: (1) height; (2) weight; (3) sitting height; (4) lumbar pull, measured by the dynamometer; (5) chest girth on expiration and inspiration.

At the public school I was fortunate enough to have the assistance of a science master who had had previous experience of biometric work with boys. In Durham Dr. George Wilson, deputy director of education for the county, most kindly helped with the measurements.

The age-groups are taken from the last and not from the nearest birthday. Thus under the heading "15" are included boys between their fifteenth and sixteenth birthdays. The other ages are similarly treated. While it was recognised that the use of the metric system has many advantages in recording measurements, it was thought wise to follow the usual practice of workers in this country and give records in English weights and measures.

Care was taken in the supervision of the actual measuring to ensure that the figures from the two groups were strictly comparable. The work was carried out by a single investigator assisted in each case by a worker of experience, and every effort was made to maintain "that continual *animus mensurandi*, absence of bias and the correctness of scales" demanded by the British Association committee of 1883.

The object of the inquiry was not merely to study the physique of two groups of different economic standing but rather to indicate adolescent physical standards to be found where conditions of environment and nutrition are optimum. The second series of measurements representing an average sample of adolescent physique as found in secondary schools is included to allow a comparison to be made between the two groups. It is hoped that this may be of interest in the light of recent reports which have shown that the diet of those attending secondary schools compares unfavourably with that of public-school boys.

For the purpose of this comparison simple observations which are recognised as throwing some light on nutrition have been made and are analysed statistically. Physical measurements have been shown to give an index at least as satisfactory as a careful clinical examination; and it is probable that, in the present state of knowledge, as much reliable information about differences in the average state of nutrition of groups of children can be obtained by taking simple measurements as by any other means.

WEIGHT

The weight was recorded to the nearest quarter of a pound. For strict accuracy the clothing should be removed and the bladder and bowels if possible be emptied before recording the weight. The circumstances of the inquiry made this impossible, and weights were taken in shirt and trousers with coats, pull-overs, waistcoats and shoes removed. In measuring the public-school boys, the same weighing machine was used throughout. In Durham the boys were drawn from schools in Stockton-on-Tees, Durham City, Bishop Auckland and Spennymoor and it was necessary to use different machines for recording the weights. The accuracy of these machines was in each instance tested before use.

The annual increase in weight of the individual child is generally regarded as of great significance. Friend (1935), speaking from his experience at Christ's Hospital, says: "The more experience one has of weighing as a routine, the more is one convinced that it is one of the most important clinical aids at the disposal of the school medical officer." A record of mean weights of groups of adolescents, though of less definite significance, is of real value as evidence of nutritional progress.

The weight of clothing worn at the time of weighing was estimated by taking the actual weight of the clothes in a number of cases. The weight was found to range from 3 to 5 lb. according to the size of the boy, representing approximately 3 per cent. of the total recorded weight. The field work was done during the spring and early summer of 1937, and although the measurements for the Durham boys were taken somewhat later in the year there did not appear to be any important difference in the weight of clothing worn by the two groups. The weights recorded are the gross weights inclusive of clothing. The numbers included in the age-groups thirteen to fourteen and nineteen to twenty are not sufficiently

TABLE I—WEIGHT (IN LB.)

Age	Public school			Secondary school			Difference ± S.E. Pub. sch.–sec. sch.	Difference / S.E.
	No. of boys	Mean ± S.E.	S.D.	No. of boys	Mean ± S.E.	S.D.		
13	21	102·26 ± 3·83	17·53	7	76·43	4·38	25·83	—
14	108	105·90 ± 1·61	16·78	94	91·27 ± 1·50	14·51	14·63 ± 2·20	6·65
15	103	123·48 ± 1·73	17·53	147	105·05 ± 1·51	18·31	18·43 ± 2·30	8·01
16	91	138·03 ± 2·03	19·40	113	122·55 ± 1·79	19·06	15·48 ± 2·71	5·71
17	119	142·54 ± 1·71	18·71	90	128·45 ± 1·75	16·62	14·09 ± 2·45	5·75
18	57	152·59 ± 2·31	17·46	27	133·15 ± 2·71	14·10	19·44 ± 3·56	5·46
19	11	154·07	11·76	23	140·59 ± 2·88	13·81	13·48	—

TABLE II—HEIGHT (IN INCHES)

13	21	62·68 ± 0·645	2·96	7	57·29	1·34	5·39	—
14	108	63·65 ± 0·295	3·07	94	60·19 ± 0·354	3·43	3·26 ± 0·461	7·07
15	103	66·64 ± 0·276	2·80	147	64·92 ± 0·295	3·58	1·72 ± 0·404	4·26
16	91	69·18 ± 0·312	2·98	113	66·02 ± 0·306	3·26	3·16 ± 0·437	7·23
17	119	69·59 ± 0·245	2·67	90	66·76 ± 0·338	3·20	2·83 ± 0·417	6·79
18	57	70·59 ± 0·336	2·53	27	66·96 ± 0·570	2·96	3·63 ± 0·662	5·48
19	11	70·69	1·79	23	68·34 ± 0·599	2·87	2·35	—

TABLE III—SITTING HEIGHT (IN INCHES)

13	21	30·83 ± 0·360	1·65	7	29·14	0·73	1·69	—
14	108	31·25 ± 0·163	1·70	94	30·49 ± 0·178	1·72	0·76 ± 0·241	3·15
15	103	32·91 ± 0·157	1·59	147	31·63 ± 0·171	2·07	1·28 ± 0·232	5·52
16	91	34·34 ± 0·187	1·79	113	33·64 ± 0·163	1·73	0·70 ± 0·248	2·82
17	119	34·65 ± 0·141	1·54	90	34·24 ± 0·158	1·50	0·41 ± 0·212	1·93
18	57	35·46 ± 0·198	1·49	27	34·83 ± 0·263	1·36	0·63 ± 0·329	1·91
19	11	36·03	1·02	23	34·87 ± 0·228	1·09	1·16	—

TABLE IV—PULL (IN LB.)

13	20	198·25 ± 19·81	88·58	7	157·86	13·05	40·39	—
14	106	213·62 ± 4·35	44·82	94	177·83 ± 2·88	27·90	35·79 ± 5·22	6·86
15	100	234·90 ± 4·92	49·18	147	218·76 ± 4·22	51·18	16·14 ± 6·48	2·49
16	89	289·46 ± 6·13	57·79	113	258·72 ± 5·03	53·51	30·74 ± 7·93	3·88
17	114	302·39 ± 5·34	56·98	90	276·63 ± 4·73	44·88	23·76 ± 7·13	3·61
18	56	327·14 ± 6·98	52·21	27	282·07 ± 9·59	49·84	45·07 ± 11·86	3·80
19	11	341·27	75·88	23	304·96 ± 11·15	53·46	36·32	—

TABLE V—CHEST GIRTH (IN INCHES)

CHEST EXPIRED

13	21	27·54 ± 0·392	1·79	7	25·50	0·694	2·04	—
14	108	27·92 ± 0·197	2·04	94	26·82 ± 0·162	1·57	1·10 ± 0·255	4·31
15	103	29·56 ± 0·208	2·11	147	28·22 ± 0·153	1·86	1·34 ± 0·258	5·19
16	91	31·18 ± 0·228	2·17	113	29·75 ± 0·184	1·96	1·43 ± 0·293	4·88
17	118	31·78 ± 0·184	2·00	90	30·30 ± 0·181	1·72	1·48 ± 0·258	5·74
18	57	32·53 ± 0·230	1·74	27	30·88 ± 0·274	1·42	1·65 ± 0·358	4·61
19	11	33·05 ±	1·30	23	31·70 ± 0·305	1·46	1·35	—

CHEST INSPIRED

13	21	30·42 ± 0·344	1·58	7	28·36	0·924	2·06	—
14	108	31·12 ± 0·205	2·13	94	29·91 ± 0·181	1·75	1·21 ± 0·273	4·43
15	103	32·87 ± 0·196	1·98	147	31·42 ± 0·175	2·13	1·45 ± 0·263	5·51
16	91	34·55 ± 0·269	2·56	113	33·25 ± 0·206	2·19	1·30 ± 0·339	3·83
17	118	35·33 ± 0·210	2·84	90	33·84 ± 0·195	1·85	1·49 ± 0·287	5·19
18	57	36·23 ± 0·253	1·91	27	34·23 ± 0·313	1·63	2·00 ± 0·402	4·98
19	11	36·45	1·08	23	35·33 ± 0·366	1·76	1·12	—

S.E. = Standard error. S.D. = Standard deviation.

large to give information of value. In the other age-groups there are considerable differences in favour of the public-school boy, who in each instance averages more than a stone heavier than the secondary-school boy (table I).

HEIGHT

The height was measured in socks, and the measurements were recorded to the nearest quarter of an inch. Growth in height is generally regarded as being less quickly affected by under-nutrition than growth in weight. Table II shows the comparative heights of the public-school and secondary-school groups. Here again there are significant differences at each age in favour of the former. The relationship of weight to height (W/H) has been used in the past for the assessment of physique. The value of this ratio gives little more information than do the two original measurements. Ordinarily good nutrition causes height to outstrip weight, so that the well-nourished child while both taller and heavier than the poorly nourished is at the same time lighter in relation to its height. It is therefore interesting to notice that in the present series of measurements the public-school boy is shown to be not only taller but also heavier in relation to his height than the secondary-school boy.

SITTING HEIGHT

In the measurement of the sitting heights Dreyer's method was followed (Dreyer and Hanson 1920). The subject is seated on a level board with the backs of his hands on the platform on which he sits, the fingers pointing backwards. The knees are flexed, the lowest part of the sacrum being in contact with the measuring standard and the weight being taken by the ischial tuberosities. The measurement taken is that between the tuberosities and the top of the head. This method avoids the introduction of errors which may arise from the contraction or relaxation of the posterior muscles of the thigh. The sitting height is recorded in order to discriminate between torso and true leg length.

Leg length is usually found to be greater where the environment is more favourable. Where nutrition is defective the limb growth is delayed more than that of the trunk, and when the environment is improved there is a marked increase in the standing height. The available studies suggest that faulty conditions of environment have a close relationship to lack of growth of the lower extremities. In table III the mean sitting height is given for the two groups. These figures show less marked differences between the public-school and secondary-school boys and in the case of the two older age-periods the differences are of borderline significance. A comparison with the figures of the mean total height show a relatively increased length of leg in the public-school boy.

PULL

The instrument used for the measurement of pull was the spring-balance dynamometer designed by Magee for work with school-children. The strength of the lumbar pull is measured, and it is suggested that the muscles involved in this—those of the thigh, gluteal regions and trunk—are less likely to be specifically developed in some individuals than the muscles concerned, for example, in the hand grip. The instrument has an adjustable handle and the level of the upper border of the patella has been found the most suitable position after extensive trials. Inconstant readings are obtained if the handle is not kept approximately at this level. The pull is made with the subject standing directly over the handle, the feet resting on the base of the instrument, one on either side of the dial. The knees are kept straight but not rigid. This technique was followed in the present inquiry. Two pulls were made by each subject. It was explained that a maximum effort should be made and the figure recorded was the greater of the two pulls. A brief rest interval of approximately half a minute was allowed between the two efforts. Cathcart and his colleagues (1935), who used the dynamometer for investigating the physique of men and women in industry, have recorded experiments made in the laboratory to determine the effect of applying tests of grip and pull in rapid succession with no appreciable rest intervals, and in other series with intervals of 30 sec., 1 min. and longer. He concluded that the resting allowance could be reduced to 30 sec. or less without detrimental results. Table IV shows the lumbar pulls of the two groups. Magee (1935) records tests made with 100 public-school boys between the ages of twelve and a half and sixteen and a half in which the relation of the pull (P) to weight (W) was found to be 2·36, the variations being within 10 per cent. The figures of the present series show a somewhat lower value for this ratio.

CHEST GIRTH

The chest girth was measured in both full inspiration and in expiration. The most accurate figure for the chest girth is probably obtained by taking the average of the circumference on forced inspiration and expiration. There has been no uniform system of measurements in the past, the girth being taken at different levels and many workers preferring to use the resting chest girth which gives a somewhat different figure.

Physical training is important in considering the question of chest girth. In schools where this is in force measurements are likely to be increased. At the public school under review there was at the time of this inquiry no system of physical training, while at the secondary schools some form of physical training was the rule. On the other hand opportunities for athletic exercises were much more plentiful for the public-school group. It was found that boys who had had chest measurements taken before and were practised performers were better able to empty the chest completely and the resulting measurements were better than in the case of boys who had had no previous experience of such measurements. The method adopted was to take the measurements at the level of the ensiform cartilage, the subject standing in an upright position with the measuring tape in contact with the skin. Measurements were taken with the chest fully expanded and after forced expiration. Table V gives the mean chest expansion at each age and it will be noticed that there is little difference between the public-school and the secondary-school boys.

DISCUSSION

The foregoing figures show well-marked differences between the physique of the two groups. The physical development of the individual is determined by a number of diverse factors of heredity and circumstance. These are extremely complex and it is not possible to define with accuracy the influence exerted individually by diet, disease, constitution and environment.

The incidence of disease will fall most heavily on those whose economic circumstances are less good. The acute infections of childhood and chronic

septic infections of the mouth and nasopharynx may produce a permanent impairment of nutrition and the poorly nourished child of low vitality remains peculiarly liable to disease. Poorer housing conditions, fewer opportunities for athletic exercise, excessive fatigue and inadequate hours of sleep may prejudice growth in the secondary-school group. Lack of knowledge of the principles of hygiene and of sound nutrition are prevalent to some extent in all classes of the community. The character of the housewife has been shown to have a direct bearing on the height and weight of children. In many households where purchasing power is adequate the income is often unwisely spent from the strict standpoint of nutrition. Such ignorance is more prevalent in those sections of the community where it is likely to prove most damaging.

Heredity is an important influence in the determination of stature. If heights of adults and of children in any class of society are taken, it is found that in general tall parents have tall children. But the assumption that differences in stature between the various economic classes are due to hereditary factors is not altogether justified. American observers have noted the remarkably improved physique of the children of Japanese, Russian and Italian immigrants into the United States, the children often being several inches taller than their parents. During the last twenty years it has been found that there are a large number of dietary factors, a deficiency of which leads to stunted growth. It is recognised that the diet of those in good economic circumstances is rich in these factors, while the diet of the poorer classes is in many cases so deficient that we would expect to find growth limited by the inadequate supply. People on the same kind of diet tend to have the same stature, and the real correlation is often one of diet rather than of inherited genes. In all cases the final limits of growth are set by heredity. How nearly such limits are approached depends on a variety of environmental conditions of which correct nutrition during the growing period is one of the most important. Thus short stature in the higher economic groups is in most cases inherited, while in the poorer classes, where dietetic deficiencies are known to exist, the inherited potentialities of growth are not fully realised. Attention has been specially focused on the so-called "protective" foods which are particularly rich in important minerals and vitamins. Such are whole-cereal grains, milk and milk products, eggs, fish, fresh vegetables and fruit. The inclusion of such foods in diets previously deficient in them has been shown to produce a definite acceleration of growth accompanied by a general improvement in physical well-being. The children are more alert, and there is improvement in the colour of the skin, the general vitality and efficiency in athletic exercises.

CONCLUSION

An attempt has been made to present as simply as possible a series of physical measurements of public-school boys whose nutrition is unusually good. It is suggested that these measurements may be accepted as standards for good physique for boys of similar age and race. Another series of measurements taken under comparable conditions relates to secondary-school boys whose physique would be considered satisfactory according to accepted standards. There are significant differences. At each year between the ages of fourteen and eighteen a boy of the first group is approximately 16 lb. heavier and 3 in. taller than a boy of the second group. His lumbar pull is 30 lb. greater. The difference noted in height is shown to be chiefly a difference in the length of leg. A record of the ratio of weight to height shows a greater weight per unit of height in the public-school group. The figures suggest that the differences in physique are roughly maintained throughout the age-period under review; there is no progressive deterioration on the part of the secondary-school boy, nor is there any obvious tendency in the higher ages to approximate to the stature of the public-school boy.

When failure in development is associated with defective nutrition the delay in growth is often made good by accelerated growth towards the end of the growing period. There is no suggestion of any abnormal acceleration of growth in either group in the present study; the figures show that growth is well maintained at each age in both groups.

It is not necessarily advantageous to accelerate the normal rate of growth. An actual imbalance of growth is not uncommon at puberty, excessive growth in stature putting an undue strain on the limited energy resources of the adolescent and thereby curtailing development in other directions. Visceral growth and cardiac reserves may temporarily lag behind skeletal development and it may be necessary to limit physical activity. Height and weight are not themselves desirable objectives nor do they necessarily betoken good health. When however growth is accompanied by obvious increase in well-being and greater bodily and mental vigour, it is good evidence of an improvement in nutritional status.

It is probable that the differences recorded in stature during adolescence are not equally marked in adult life. Where nutrition is good early maturity in size and physique is the rule. The period of growth is longer in the case of boys in less favourable circumstances and there is likely to be some approximation in stature after the age of eighteen due to the later maturity of the secondary-school group. It is emphasised that the differences in the physical development of the two groups as reflected in the present data correspond to differences known to exist in their diets, and it is suggested that a relative deficiency in food factors responsible for satisfactory growth has been instrumental in bringing about these differences.

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". . . The keys to the successful organisation of science are freedom and democracy. Nowadays freedom for individual research means more than the absence of prohibition or even of compulsion; it implies the provision of adequate material and help. Thus the limitation of subsidies and organisation for science is probably the most effective way to stifle discovery, for discovery and fruitful application can no longer be counted on to come of themselves; they need intelligent provision. The consciousness of a common aim binds people together far better than any autocratic ordering. But the present organisation of science is not free and democratic, it is still in form authoritarian and hierarchical, and any new organisation must base itself far more on voluntary association and on the executive power of councils of all grades of workers."—J. D. BERNAL, F.R.S., *New Statesman and Nation*, Aug. 5, 1939, p. 211.

FRACTURES

THE ORGANISATION OF TREATMENT

MORE than a million and a quarter injuries are treated each year in the hospitals of Great Britain, and of these about 200,000 are fractures. Although there is no means of estimating the cost to the community of these accidents, it must run into many millions of pounds. In 1937, for example, the cost of compensation under the Workmen's Compensation Acts was estimated at about £13,000,000; and only about a third of all fractures are due to industrial accidents.

Though prevention is preferable, rapid and complete cure will minimise the loss suffered by the injured man and less directly by the community. It is here that surgery must take responsibility. Unfortunately the treatment of fractures is often inefficient and recovery is slow and incomplete. No-one would deny this and a remedy must be found.

The final report of the Interdepartmental Committee for the Rehabilitation of Persons Injured by Accidents [1] is an interesting and valuable document. Although the terms of reference of their inquiry include all kinds of injuries, the committee have in the main concentrated on the treatment of fractures. At the same time they think that once an efficient fracture service has been established it will naturally attract to itself many allied conditions such as severe lacerations and sprains and injuries of the hand and fingers. It should exclude, on the other hand, injuries to the head and abdomen, for these are better treated by specialists in cranial and abdominal surgery: the committee are opposed to a comprehensive traumatic service.

FRACTURE SERVICES

By far the most important recommendation in the report is that special fracture services (or clinics) should be set up throughout the country and that they should be based on three principles:

(1) All fractures (except those of the head) should be segregated in a single department, which would provide for both inpatients and outpatients.

(2) The service should be operated and controlled by a single team under a surgeon in charge.

(3) The treatment should be continued until the fullest possible restoration of working capacity has been attained.

The accommodation required is discussed in detail and plans are given of two recently erected fracture clinics. The items include a "shock room" for the immediate treatment of seriously injured cases, an X-ray department with a portable apparatus, a department for physiotherapy and remedial exercises, and an efficient system of records.

The personnel centres in the surgeon in charge, and if the clinic is established at a voluntary hospital he should preferably be a member of the visiting staff with a special interest and experience in the treatment of fractures. It is suggested that he should receive a fairly substantial honorarium (say £500 a year in a hospital of over 500 beds) for the special and onerous duties he would undertake. The amount of time he would have to give to the fracture service would considerably reduce his opportunities for more remunerative work and some compensation would be essential if the best man is to be obtained. He would be permanent and he would personally control and supervise every stage of the patient's treatment, thus ensuring the coördination and continuity which are essential in an efficient fracture service. Under him would be one or two whole-time assistants of the standing of registrars, besides resident house-surgeons. There would be close coöperation between the fracture service and the orthopædic department.

1. London: H.M. Stationery Office. 1939. Pp. 194. 3s. 6d.

RESTORATION OF FUNCTION AND HEALTH

Treatment should continue until the fullest possible functional recovery has been attained. The importance of the early stages of treatment, the accurate reduction and immobilisation of the fracture, is not underrated in the report, but it is the next stage, the restoration of function, that is considered in most detail, for it is in this stage that the present system of treating fractures is held to be most seriously defective. Although physiotherapy, such as massage and electrical treatment, may play a valuable part, active movements of the muscles and joints are of greatest importance and are best carried out under supervision in some kind of gymnasium.

There are several reasons why these remedial exercises should be done at the clinic. In the first place they can be supervised, which is the only way to ensure their being done properly. Secondly, the example of other patients and competition with them are useful stimuli. And thirdly, the patient is away from his home, where conditions are often depressing and the cause of anxiety and discouragement. He should be made to consider his efforts towards recovery as a whole-time job, and should spend as much time at the clinic as possible. Later may come the question of light work. A job created merely to keep the man occupied is not good enough. Too often light work exercises every member except the injured one. The surgeon in charge should satisfy himself that the work is of the kind the man requires to complete his recovery and should see him from time to time at the clinic until he can do full work. In some cases when a man's work is heavy he may need a course of general reconditioning, even though the function of the injured limb has returned to normal. Such cases should be few if efficient treatment has been given at a clinic with adequate facilities, but when they do arise it is suggested that the physical-fitness centres which are being established under the National Fitness Campaign might meet their requirements. The London Midland and Scottish Railway already have at Crewe an establishment which does excellent work of this sort. Every effort should be made to abolish the dangerous interval sometimes intervening between the patient's discharge from treatment and his resumption of full work. For those cases where permanent disability incapacitates a man from following his old occupation, a vocational training centre might be established by the Ministry of Labour to train him for some other work.

The report also deals with the psychological factors influencing recovery from the effects of an accident. The fracture service can have little direct control over some of these, but there is general agreement that the efficient treatment of the patient in an organised fracture department will go a long way to prevent some of these abnormal mental states arising. A lot can be done by suggestion, through the surgeon in chief and his assistants, that complete recovery is to be expected as a matter of course, and in a successful clinic the high proportion of rapid and complete

recoveries will speak for itself. Financial worries and the anxieties and difficulties connected with compensation are often a cause of emotional mischief, and although they are fully and sympathetically discussed in the report no final solution is suggested. As a royal commission has been appointed to consider the whole question of workmen's compensation the committee make only one recommendation in this connexion—namely, that a man should continue to receive compensation as for total incapacity so long as he is under treatment at the fracture service unless he has been found suitable light work and is earning wages.

Some of the troubles that beset an injured man and may retard his recovery can be mitigated by the good offices of an almoner's department: for instance, the home conditions can be inquired into and distress relieved by drawing on some appropriate fund; extra nourishment for the patient or his family may be provided where it is found to be needed; and if he cannot afford his fares to and from the clinic help may be found. The almoner may also do very useful work as an intermediary between a man and his employer, by helping to solve such problems as the securing of suitable light work, or perhaps by obtaining an assurance that work will be found on recovery.

WHAT SHOULD BE DONE NOW

The committee recommend that steps be taken now to establish fracture services in all parts of the country. Schemes should be worked out in consultation between the local hospital authority (i.e., county or county-borough council) and the representatives of the voluntary general hospitals, and it is strongly recommended that a standing joint committee of the two bodies should be set up for this purpose. Other interests, such as the local bodies representing the medical profession and the organisations of employers and workers, should also be consulted. Where a full fracture service cannot be established at once it is recommended that temporary provisional arrangements be made which secure the main principles of a fracture service. The important thing is to get started.

Capital expenditure will sooner or later be necessary in the institution of fracture services, and the report suggests that this should be met by the benefactions of public-spirited individuals and general public support. To help to meet the cost of maintenance it is proposed that the local authority should make an annual subvention. In addition the limits imposed by the Road Traffic Act on the amounts that may be recovered by a hospital for treatment of road-accident cases should be abolished, and also the approved societies might make a larger contribution, by way of additional benefits, to hospitals that establish adequate fracture services.

Their inquiry convinced the committee that the training of medical students in the treatment of fractures is, in general, seriously deficient and that a period of training in the fracture department should be made an obligatory part of the curriculum. Various suggestions were considered for applying this recommendation: one or two of the six months set aside for inpatient surgical dressing might be devoted to attending the fracture and orthopædic departments; or, if it was considered inadvisable to shorten the period of general surgical dressing, then the course on fracture training would have to be fitted in elsewhere. The fracture departments would also provide excellent facilities for postgraduate study and refresher courses.

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENT)

VOLUNTARY HEALTH INSURANCE

FROM July 20 to 22 representatives of associations which provide medical care on a prepayment plan met in New York. Among these associations were groups described by Dr. Hugh Cabot as "producer-coöperatives" (such as the Ross-Loos clinic in Los Angeles and the Trinity hospital group at Little Rock, Arkansas) and "consumer-coöperatives" (such as the group health association of the home owners' loan corporation in Washington, D.C.). The numerous industrial medical organisations were not represented. This was the first meeting of all the voluntary health insurance experimenters. The difficulties of organising for group practice under existing state laws, and the opposition of organised medicine to this type of experiment, were discussed. General applause greeted Dr. F. Goldman of Yale when he stated that while abuses do exist under all insurance systems, including those of England, France and Germany, the danger of abuses had been greatly exaggerated and could be met by proper organisation. When turnover was discussed, the group health association in Washington described how there are regularly 25 members each month transferred from the government service or from the city of Washington. Dr. Michael Shadid of the farmers union coöperative hospital association, Elk City, Oklahoma, said that in his experience there was no turnover, since the hospital at Elk City is owned by the farmers of Oklahoma, who are fully conscious that the interests of the coöperative are their own.

An encouraging feature of this conference was the presence of speakers who considered simply the ideal of good medical practice. Prof. John P. Peters described forcibly the ever-increasing acceleration of the potentialities of medicine combined with the poor record of these potentialities being realised. "The medical profession," he said, "congratulates the system of individual competitive practice for the high estate of medical science in this country. In actual fact the practitioner is playing an ever-diminishing rôle on the productive side of medicine. The new diagnostic and therapeutic procedures which he employs and the apparatus which he operates emanate more and more from full-time salaried workers in educational institutions, research organisations or commercial firms. Often enough the inventors have not even a medical degree. The physician is being relegated to the position of distributor and technician." He warned his hearers that medical groups must not develop on department-store or repair-shop principles; if this happened, their doctors would sink to the level of clerks and technicians. Groups must be organised so as to attract men with high intelligence and education, and offer them opportunity for continuous intellectual development. The group clinics had an opportunity both to provide exemplary medical care and to give the staff opportunities for educational growth.

The organisation of an ideal medical group was also discussed by Dr. Hugh Cabot, until recently of the Mayo Clinic. The most essential member was the man who was called in America an "internist." Dr. Cabot felt that if there was an internist, there must also be an externist, and so the most satisfactory thing was to rechristen the internist a "good general physician." This man should add up the observations of all the specialists and consider them as a whole. Whether

or not all patients should be shown to the specialist depended upon the kind of specialist employed. It was a waste of time to let the expert with a microscopic mind review all cases. Every group should include experts in the special senses, in surgery, and in dermatology and roentgenology. Good medical care must be based upon preventive medicine. They were still making faces at syphilis and not doing so much more satisfactorily than they were twenty years ago. Good medical care must enable the sick to have at their disposal the whole machinery of modern medicine. It was improbable that more than 10 per cent. did get care of this kind. Good medical care could not be got as long as doctors' incomes depended upon providing it. There were three fields of knowledge involved in group medicine: sociology, economics and the scientific practice of medicine. Capable representatives in these three fields must be consulted. For forty years Dr. Cabot had insisted upon a yearly report from each of his students. They had asked him, "Where is this practice of medicine you told us about?" Their elders who were under oath to look after them saw to it that the young man got no chance to work. They needed the services of youth with its energy and idealism, and they would not get good medicine as long as the emphasis was on age, experience and whiskers.

At the concluding session it was agreed to form a national association which will hold its first regular meeting in Chicago next year.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

THE SCOTTISH CHILD'S INTELLIGENCE

A STUDY of child intelligence in Scotland has been occupying the Scottish Council for Research in Education for the last two years, and their report has just been issued. Three groups were studied: the first from the four major cities, the second from the industrial belt, and in the third from predominantly rural districts. On the Binet tests the mean intelligence quotient for the total sample of children was 100·11. Boys showed a mean quotient of 100·51 and girls 99·7, a difference which is not regarded as statistically significant. A slightly lower level was found in the children of the industrial districts compared with those of the urban and rural groups. The average level in rural children is not inferior to that of the city children. It is felt that the remarkable uniformity of educational opportunity which has been achieved in Scotland must have had an influence on the development of intelligence in areas where environmental conditions might otherwise tend to create a lower intelligence level. Performance tests were also studied and here again the lowest mean level of ability was found in the industrial belt, but on these tests the city children were found superior to the rural children. A definite sex difference on the performance tests was apparently due to a slower rate of development of ability in girls than in boys. Equal results were obtained at the age of 8 or 9 years but thereafter boys became increasingly superior.

INCAPACITY AMONG SCOTTISH INSURED POPULATION

Miss Muriel Ritson, controller of insurance and pensions, stated last week that there were over 26,000,000 days of incapacitating sickness from June, 1937, to June, 1938, in the insured population of Scotland. This figure was slightly lower than that of the previous year, but it was for a year in which no influenza epidemic occurred. Of the lost days 11½ million were accounted for by 31,000 men and women who were sick throughout the year. It was known that the main causes of long-term disablement were diseases of the nervous system, bronchitis, valvular disease of the heart, rheumatism and tuberculosis. Scotland had a long and honourable record of measures for combating disease and raising the standard of health, but so long as there remained such a mass of chronic and disabling disease among the living they must not rest satisfied. In the prevention of long-term illness greater stress must be laid on the factors concerned in building a healthy body rather than in patching it up when ill health appeared. Social workers could not but wonder how the stress and strain of the present anxious times would affect the health of the peoples of Europe. It would be a bold prophet who would forecast the results of this so-called "war of nerves."

DENMARK

(FROM AN OCCASIONAL CORRESPONDENT)

GASTRIC AND DUODENAL ULCERATION

DURING the last few years perhaps the two subjects most prominent in Danish medicine have been pneumonia and gastric and duodenal ulceration. Pneumonia has attracted attention because of serotherapy and chemotherapy, and gastric and duodenal ulceration because of the recent remarkable changes in the frequency and sex distribution. The interest taken in this subject in Copenhagen has spread to the provinces, and in the town of Aarhus Dr. A. Guldager and Dr. F. Heintzelmann have reviewed the incidence of manifest ulcer hæmorrhages in the 20-year period 1918–37. To make their comb-out as complete as possible they scrutinised the records of the municipal hospital. A study of 341 cases of manifest ulcer hæmorrhage shows a striking increase in the condition. This seems to be exclusively due to the greater tendency of males to develop gastric and duodenal ulceration, with hæmorrhages. During the period studied the increase in admissions to the medical wards of this hospital was proportional to the increase in the town's population in the same period, whereas the number of patients suffering from ulcer hæmorrhages was more than quadrupled. At the beginning of the same period men and women were equally liable to ulcer hæmorrhages, whereas at the end the ratio was four to six men for every woman. This sex discrimination most unfavourable to the male is still unexplained.

SERUM TREATMENT OF PNEUMONIA

For those who, like the Danes, have thrown themselves heart and soul into the campaign for serum treatment of pneumonia, there is something tantalising and almost exasperating in the diversion created by chemotherapy. The possibility that Prontosil may be a red herring or an ally rather than a competitor of serum treatment is comforting the workers at the Danish state serum institute. There since 1935 Dr. T. Madsen, its director, has created a special department for examining sputum, typing pneumococci, producing serum, and researching into the serology of pneumonia. This work is obviously important, since the average case-mortality from pneumonia in Denmark has for some years been about 20 per cent. and during the 15 years

ending 1936 there have been about 10,000 deaths in Denmark from croupous pneumonia alone, irrespective of bronchopneumonia.

The pneumococcal rabbit serum issued by the state serum institute and now in general use in Denmark has been found to be quite as effective as horse serum, and a dose of 200,000 units now costs only about Kr.40, whereas the price for the same quantity used to be about Kr.350. The concentration of the serum has been increased so that now there are 4000 to 6000 units in every c.cm. The serum is in most cases given intravenously rather than intramuscularly. The results, as shown by a recent study of Dr. N. I. Nissen, have been quite encouraging. His material has consisted of 932 cases of pneumonia in which serum was given. The mortality of 13·5 per cent. might well have been reduced for window-dressing purposes had he allowed himself the luxury of weeding out several fatal cases in which the serum treatment was not given a fair trial.

FATE OF LUPUS PATIENTS

Dr. C. N. S. Gundtoft has inquired into the causes of death of patients who had attended the skin department of the Finsen Institute in Copenhagen during the past 25 years. He collected information about 211 such cases. His findings suggest that the patient who suffers from lupus vulgaris runs little chance of dying of this disease, but he has a fifty-fifty chance of dying of some form of tuberculosis. The deaths ascribed to lupus itself numbered only 10. But there were as many as 61 patients who had died of pulmonary tuberculosis, and 33 who had died of some other form of tuberculosis, such as tuberculous meningitis. As for the non-tuberculous causes of death, malignant disease was the most important, being responsible for 24 deaths. This is in itself a testimony to the benign character of the lupus which allowed its victims to attain a high enough age to become subject to malignant disease. Pointing in the same direction were the 8 cases in which the cause of death was said to be senile decay. Dr. Gundtoft draws attention to the great frequency with which pulmonary tuberculosis broke out shortly after treatment of lupus was started; he suggests that in these cases the lupus had been the cutaneous manifestation of an already serious though still latent pulmonary tuberculosis. The late Dr. Reyn, formerly chief of the Finsen Institute, was among the first to emphasise the importance of a tuberculosis background in the lungs and elsewhere of patients who at first sight seemed to be suffering from lupus and nothing else.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM DOCTOR DON

III

EVERY time I revisit London I rejoice that I no longer live there. Somewhere about 100,000 appears to be the maximum size to which a town can grow and remain a coördinated social organism. Beyond that level its membership becomes as irrational and irresponsible as a swarm of locusts or lemmings. When people are condemned to live in Hoxton or Clerkenwell or one of those amorphous areas around Wembley or Penge, it is almost impossible for them to feel local patriotism or to take an active part in the life of the community. The women's institutes have developed so vigorously in the villages that they have become a power in the land, but the health centres and community centres in the towns languish and seem unable to stand by themselves. The picture-palace, the billiard-room and the by-pass road are poor substitutes for the parish pump and the village hall, and largely in consequence Hog's Norton is months ahead of London or Birmingham in A.R.P. Dwellers in the Harley-Wimpole Street area develop a sentimental attachment to St. Marylebone, but I lived there for five years without knowing the names of the mayor, the town clerk or any of the borough council, and I am sure this experience is not unique.

In medicine London has become the great *Wasserkopf* with hundreds of consultants and thousands of consultoids. I have always deplored and fought against this over-centralisation, though it is probable that the specialist must follow the crowd as the salmon follows the herring shoal. It is a bad thing that the *Wasserkopf* should dominate clinical education as it does by historical prestige, weight of numbers and proximity to the Royal Colleges. Few teaching physicians in London have many friends outside their own profession and fewer still work actively alongside scientists, humanists or industrialists. The state of affairs is quite different in places like Aberdeen, Edinburgh or Oxford. In Aberdeen, for example, with the Rowett Institute and the fishing industry looming so large, it is natural that clinical teaching should be permeated with the importance of nutrition and industrial hygiene. London clinical teachers are preoccupied with technical matters of interest to the guild, such as the differentiation of subarachnoid bleeding from cerebral hæmorrhage or the separation of coronary thrombosis from angina of effort, and they are less likely to stress really significant things which are new but not easily incorporated in their craft, such as the facts that a high-carbohydrate diet requires more vitamin B, or that compensation tends to increase the incidence of the disability compensated. The cynic cannot but observe that the deification of London applies not at all to the fundamental sciences.

In surgery also famous schools have recently flourished outside London—in Edinburgh, Leeds and Newcastle, for example. It is internal medicine and related subjects such as pædiatrics and psychology which have received excessive representation in London and this suggests to me that as at present practised they are luxury trades. The state of affairs in America and Germany, where there are many university schools of equal prestige, is much healthier, and the whole-time or semi-whole-time clinical units in the Scottish universities, in Manchester, Cambridge and Oxford, may restore British medicine to a better condition. For highly trained physicians to do much of the pettifogging work that is done in the Harley Street area is as if the president of the Royal Society was employed at mending old ladies' wireless sets. It is perhaps no worse than the tradition in music where artists of the calibre of Hindemith may give lessons for fees and cannot very well pick and choose their pupils, but it links medicine with the seamier side of the arts. I was going to say that medicine

should be more of a priesthood; but the church has been commercialised for centuries and bishops more commonly celebrate marriages in Westminster than in Wigan.

* * *

The sixty-mile journey to London takes little over an hour and the time passes pleasantly enough. For the two-mile journey from Paddington to the Royal Society of Medicine the bus requires twenty minutes and a succession of stops, but this allows me to study the most important section of Oxford Street and the crowd which throngs it. The concourse of women busy about nothing impresses me with one of the less favourable aspects of the rise in the standard of living. Seen from the top of a bus one must perforce regard them as a herd or group and criticise them on the basis of the opportunities they have had and the æsthetic pleasure they provide. The poets have stated that they are less beautiful than the animals and with this one cannot but agree. Nor can they compare with the crowds in clogs and shawl against whom I jostled on the streets of South Lancashire thirty years ago. Those women were rude and coarse but they expressed vitality and they wore a local costume or industrial uniform which enhanced the looks of the pretty and made the whole group attractive. The outburst of sympathy for Gracie Fields expresses a nostalgia for a day which has gone since Mrs. Deeds came to town. To see an attractive crowd today one has to travel to Ireland or to the Mediterranean—somewhere in fact where poverty still reigns.

It is curious that women who pass so much of their time gazing in shop windows and spend a big proportion of their income on clothes should make such a bad job of it. The colours are drab, there is no sense of form, and the lines of hat, neck-line, waist and skirt clash in a way that the most amateur student of composition would avoid. Skirts are either too long or too short, and high heels throw the silk stockings in wrinkles or make the calf muscle unpleasantly prominent. Hair has improved in the last two years as bobbed hair has grown a little longer but is still too often either frivolous or frowsy. Finally, modern outdoor dress for women is exceedingly unkind to those—and they are the majority—in whom the contours have begun to sag. An Indian woman in her sari, however old her face or form, appears in this crowd like a songbird amidst the sparrows.

I will not deny that the area between Marshall and Snelgrove and Dorville reveals some better lookers, but these are largely young saleswomen and buyers whose face is their fortune. Moreover the last thing I grumble at is that women are attracted by pretty things in shops. I read *Vogue* regularly and I appreciate the thrill women get out of colours, surfaces, textures, furs and jewels. It is not the expense which is lamentable but the result. About the only dress in which a crowd of women looks really attractive today (and remember I am thinking of them as groups and not as individuals) is the semi-nude of the bathing beach, the tennis-court and evening dress. Allow them more liberty and they become fussy or dowdy. Access to the materials and markets of the world has been as bad for the modern woman as for the modern builder, and women's dress today is as depressing to look at as the new estates they live in. I do not believe the average crowd of women will ever look attractive unless their dress freedom is confined within narrow limits; but until we can provide the right amounts of Norman Hartnell and compulsion, the promenaders in Oxford Street will continue to be unprepossessing and I on top of my bus will sigh for the attractive crowds of Kos and Rhodes.

When I look into the faces of these women, I feel that very few of them have "laid hold on life" in the words of the hymn tune or are keeping themselves in intellectual or spiritual training. Behind them I see the English middle-class home. No account of trench warfare makes the reader feel its boredom, and no play, film or novel sufficiently stresses the insipid quality of English bourgeois life. With the decline of child-bearing and of religious interests the field of consciousness has narrowed at the same time as the amount of leisure has increased. The day passes with aimless chatter as to why Mrs. X has changed her window curtains, what year Princess Y had her operation, whether the latest child-murderer has a kind face, and the like. Much of the discussion leads to bickering and rouses emotion out of all proportion to the context, for the atmosphere is charged with unutilised energy and any little lightning conductor attracts the storm. All those trivialia and tempers are stamped on the faces of the Oxford Street women. And so let us leave them to get back to their jerry-built homes.

* * *

I really do not know why I pay fifteen guineas a year to a club when I usually lunch at the Royal Society of Medicine, close to my books and journals. The creation of the Royal Society of Medicine out of a group of pre-existent societies impresses me as one of the greatest feats of our time; and if any survive of those that worked that miracle, I should like them to know that we of a younger generation bow down and call them blessed. For the Royal Society of Medicine is undoubtedly as efficient, obliging, useful and comfortable an institution as any man could hope to belong to.

* * *

But I must hurry off to my committee; which, after all, is the nucleus round which the rest of this day's activities cluster. It is customary and of course easy to regard committees as the bane of professional life. This is partly because they are not called board meetings, attendance at which is handsomely rewarded, but it is even more because they are so often inefficient at their work. Hospitals cannot function or laboratories be built without some mechanism for pooling the knowledge and advice for their direction, but the method of representative government commonly followed in colleges and hospitals, where every fellow, or everyone who is in charge of beds or head of a department, is on the committee, is fundamentally wrong. A college does have the advantage of a permanent president, but the chairman of a hospital committee is commonly appointed on grounds of seniority rather than efficiency. When I have seen a hospital committee solemnly discuss whether the charlady should retire on pension at 55 or 60, or a college meeting with an attendance of nearly forty fellows, whose time must be worth at least 15*s*. an hour per head, waste half an hour deciding whether the catalogue of college plate should be duplicated or printed with pictures, I have realised only too clearly why democracy has failed in so many countries.

The Medical Research Council, with a highly skilled permanent secretariat, an independent chairman, a limited membership of experts with regular retirements and replacements, and a large number of specialised subcommittees of a purely advisory nature, seems to me a model which might be more widely copied.

There is no medical or paramedical organisation in the country which spends £250,000 a year with greater wisdom or profit. With the development of joint hospital boards and hospital amalgamations important committees have swollen to gigantic size, and they should now regard themselves merely as a folk-moot which will create a new instrument of government and then disband. I have said elsewhere that most medical schools would do well to have their organisations overhauled at intervals by a business psychologist or efficiency expert, and I am sure that the trend is towards smaller executive committees with greater authority, more employment of junior staff on advisory committees, more whole-time administrative personnel, and the disappearance of the idea of a committee as a soviet or a place to blow off steam.

* * *

Blackham's amusing article sets me wondering why the applied physiologists, who are so happy for an excuse for a trip abroad, have never taken up the study of sea-sickness. They have dwelt on Pikes Peak and with sulphur-miners on the high slopes of the Andes, they have raced their mules in the torrid deserts of Mexico, they have heard the avalanches roaring down Everest and the ice cracking at the Poles, but I do not remember ever to have read of an expedition to study sea-sickness. Of course it would be difficult to do laboratory experiments beforehand, for everyone seems to agree that behaviour in the Barany chair has little to do with a life on the rolling main. Nor does there seem to be much to measure, for though a series of papers on the *Electrolytes of the plasma, the sweat and the vomit in sea-sickness* or *Audiometric tracings in the prevertiginous stage of morbus maris* might look well in my departmental report, they would merely add to the literature and not lessen the burden of sea-sickness. And then there is the horrid psychological factor.

So it is clear that it is no use applying to the applied physiologists, and our ship must be manned by men of robuster breed, the clinical experimental therapeutists. We believe that it can be quite a profitable occupation to put drugs of which we know little into bodies about which we know still less, provided we follow certain general rules, which are now pretty clearly established. It often requires a great deal of moral courage on the part of both patient and investigator, as is clearly shown in Murphy's account of the discovery of the liver treatment of pernicious anæmia. Mainly by these methods we have found that nitroglycerin relieves angina, theophyllin-ethylendiamine relieves periodic breathing, adrenaline asthma, ergometrine migraine, and phenobarbitone and diphenylhydantoin relieve epilepsy, and we believe that by the same methods we shall find a symptomatic cure for sea-sickness, nocturnal enuresis, colon-spasm, chorea, and most other manifestations of this type, perhaps before we know what is happening to the cholinesterase or the catalase gradient in them. We finally believe that we shall creep back into the fold under the label of chemotherapeutists now that empiricism is once more in fashion. So if anyone will supply me with a boat of 15,000 to 20,000 tons, and about 300 passengers who have been bribed by cheap cruising rates to agree to accept when necessary special diets, drugs and routine ward procedures, I shall be very happy to organise an expedition to study sea-sickness. On our first trip we shall probably go north, as it sounds rough north of Cape Wrath (though I believe the name really means the turning-point), and in any event I have always wanted to see Greenland's icy mountains.

PUBLIC HEALTH

ADVANTAGES OF CENTRALISATION IN THE HOSPITAL TREATMENT OF FEVERS

By Duncan Forbes, M.B.E., M.D. Edin., D.P.H.
LATE MEDICAL OFFICER OF HEALTH FOR BRIGHTON

Primarily fever hospitals were built to provide for the *isolation* of patients, for it was hoped in this way to control the spread of such diseases as scarlet fever and diphtheria. Just as the exclusion of home contacts with measles fails to prevent the spread of the disease throughout infected schools, because the chief sources of infections are the large numbers of school contacts who develop and spread the disease, so the isolation in hospital of scarlet fever and diphtheria patients has failed materially to affect the incidence of these diseases, because the chief causes of spread are the overlooked case and the carrier who freely mix with their fellows. Further, patients nursed with others not only run a risk of contracting diseases such as measles and chickenpox, but often have their period of infectivity prolonged: for instance a large proportion of cases of scarlet fever acquire other strains of hæmolytic streptococci which render them more highly infectious on discharge than home-nursed patients. The chief function of the fever hospital, therefore, is no longer the isolation but the efficient treatment of the patient, including the prevention of cross-infection during his stay in hospital.

The public, influenced by the fear of the spread of infection, did not grudge the capital cost of fever hospitals because they regarded, and still regard, the isolation of these dangerous patients in hospital as of primary importance to the common weal. Unfortunately they have not the same interest in the care of the individual patient in hospital, and although it has been proved that to prevent cross-infections the present large undivided wards should be supplemented or replaced by smaller ward units and cubicle wards, local authorities are loth to expend money for the provision of these. They are equally backward in the provision of efficient medical treatment for the patients.

EFFICIENCY IN TREATMENT IN LARGE AND SMALL HOSPITALS

It is not surprising therefore to find great variations in the standards of treatment possible of attainment in fever hospitals. There is no doubt that higher standards are maintained in the large fever hospitals provided, for instance, by the London County Council and the large county boroughs. There we have medical superintendents in charge who give their whole time to fevers and who are assisted in their work not only by a resident medical staff and a highly trained nursing staff but also by visiting consultants. Patients are seen by a doctor in the ambulance or receiving-rooms before admission, doubtful cases are properly isolated and all patients are at once given appropriate treatment including

the *intravenous* injection of antitoxin in most cases of diphtheria.

Compare this with conditions in a small fever hospital in charge of a matron who sees the patients on admission. Later she telephones the doctor in charge who gives instructions and prescribes treatment on the matron's report. If the patient is severely ill the doctor pays a special visit as soon as he finds it possible; the moderate and mild case may not be seen until his next routine visit. Administration carried out on these lines is likely to lead to disastrous results from time to time. In diphtheria, for instance, antitoxin is usually administered *intramuscularly* by the matron. This leads to a great lengthening of the interval between the admission of the patient and the entrance of antitoxin into the blood-stream, regardless of the fact that each hour's delay increases the danger of subsequent paralyses and may even mean the difference between recovery and death. When we consider that, to ensure the earliest possible entry of antitoxin into the blood-stream, general practitioners are advised not to await a swab result before notification, and that patients are admitted at any time night or day, such delay in, or omission of, *intravenous* injection on the admission of the patient seems inexcusable. Again, even if the non-resident doctor hurried to the hospital to be ready to treat on admission the occasional case of diphtheria, he might find difficulty in giving an intravenous injection to the young child with an abundance of subcutaneous fat. After the closure of the fontanelle it may be necessary to cut down on a vein or to give an intraperitoneal injection, and these methods being unfamiliar may not be adopted. In any case success is more likely to attend the resident physician who treats large numbers of cases in a large fever hospital.

Passing to another matter, supervision and treatment by the specialist, for instance in middle-ear disease, are more easily arranged and more conveniently carried out at the large well-staffed and well-equipped hospital.

These are but examples which could be multiplied, as the whole administration of the fever hospital is now highly specialised as to treatment, nursing, and isolation. No-one with a knowledge of the subject doubts that, broadly, the larger the hospital is, the more highly qualified the medical staff, the better the facilities provided and the higher the standard of treatment.

GROUPING

Under section 63 of the Local Government Act, 1929, and section 185 of the Public Health Act, 1936, county councils have had surveys made and have submitted for approval to the Ministry of Health schemes which should have ensured adequate provision for the isolation and treatment of persons suffering from infectious disease. Such schemes were made after consultation with the component authorities and, when necessary or when deemed advisable, with county boroughs. As the Ministry of Health was in favour of infectious diseases being treated in central hospitals, of a size which would constitute efficient and economical self-contained units, serving reasonably large areas, and as most county medical officers were of a like opinion, it no doubt was the aim of the latter to concentrate treatment in a few large rather than in a great many small hospitals. Their difficulty was "to reconcile the individual and often conflicting claims of the several isolation hospital authorities in the county, so that the best use might be made of the existing accommodation."[1] It was still harder for the county medical officer of health, with any hope of success, to suggest a general closure of small hospitals and the establishment of a large central hospital, even when he recognised that such a procedure would lead to greater efficiency in treatment and in the long run to economy. Likewise it was not a simple matter to have any large number of beds reserved in the relatively large county-borough fever hospitals unless the county council agreed to pay the cost of the additional accommodation required. The result is that progress has been slow and there still remains a multiplicity of small fever hospitals, although the earlier average of some 40 beds has no doubt been increased to a small extent.

1. See the fifteenth report of the Ministry of Health, p. 67.

AREA WHICH CAN BE CONVENIENTLY SERVED BY A FEVER HOSPITAL

In the days of the horse ambulance and indifferent roads, distance was a serious matter. In a well-sprung motor ambulance 30 miles can now be covered in an hour with no discomfort to the patient. There is no reason, therefore, if otherwise convenient, why a centrally situated hospital should not serve an area of 2700 square miles or more. Naturally if it were decided to centralise treatment the largest hospital in any area would be selected, and its accommodation increased as required and brought up to date. The smaller hospitals closed for fever work could often be used in a conjoint scheme for other purposes, as continuation hospitals, or for convalescents, tuberculosis, orthopædic cases, rheumatic hearts and even for overflows from the central fever hospital at peak periods in infectious disease incidence. Practical experience shows that parents have no serious objection to the removal of fever patients to a distance, so long as they are kept informed of the patient's progress and are asked to visit if the patient is dangerously ill. The very fact that the patients were drawn from a wide area would minimise, although it would not overcome, the difficulty of staffing due to the continuously varying incidence of infectious disease.[1] In this connexion I find that, taking an area, including boroughs and urban and rural areas, with a population of over 400,000, the number of notifications over a period of eight years was at peak periods for scarlet fever 2½ times, and for diphtheria 3 times, the average, whilst for a town of 150,000 the peak figures for both scarlet fever and diphtheria were 4 times the average.

The following figures show the number of notifications in 4-week periods for the larger and smaller populations mentioned above.

NOTIFICATIONS IN 4-WEEK PERIODS

	—	Over average	Average	Under average	Maximum	Minimum
A	Scarlet fever..	27 (113)*	1 (71)	63 (44)	180	19
	Diphtheria ..	31 (32)	4 (18)	56 (9)	57	2
B	Scarlet fever..	31 (41)	4 (22)	56 (11)	95	2
	Diphtheria ..	32 (16)	7 (8)	52 (4)	43	0

A = Population, 400,000; B = 150,000

* The figures in parentheses show the average number of notifications in the periods named, thus there was an average of 113 notifications in each of the 27 weeks when scarlet fever was over the average.

It is evident from these figures that, whether the population be large or small, there will tend to be rush periods alternating with longer periods of under-occupation and over-staffing. Such difficulties are more easily overcome in the large hospital with a sufficiency of cubicle blocks and varying sized wards,

quite apart from the lesser variations in the number of notifications in the larger, compared with the smaller, populations served.

The Departmental Committee on the Cost of Hospitals, in its final report, states that to provide a small (fever) hospital with the full equipment and facilities appropriate to a large one would be unduly costly, and that it is hoped that, by coöperation on the part of local authorities, the erection of very small isolation hospitals in the future will be avoided.

HOW REFORM CAN BE ATTAINED

If it is agreed that the small fever hospital with no resident medical staff should be closed when possible, how can this desirable reform be attained? What can be done for instance in the case of a county borough with a combined sanatorium and fever hospital of 170 beds requiring the addition of cubicle blocks to bring its accommodation up to date? A fever hospital of 50 beds is situated within some four miles, and four other fever hospitals of 28, 18, 12 and 12 beds serve areas within a reasonable distance; none of these five hospitals have a resident medical officer. Can we hope that the county, the county borough and the other authorities concerned will grasp the urgent need for centralisation of fever work in the relatively large county borough hospital, will get together, and, within the next two or three years, agree on a scheme for the centralisation of their fever work? Only the confirmed optimist would answer in the affirmative. Whilst some good work has been done under section 63 of the Local Government Act, 1929, and section 185 of the Public Health Act, 1936, progress is slow and is not of the radical nature required; the reforms carried out still leave, unclosed for fever work, large numbers of small fever hospitals with not even one resident medical officer. The history of the last ten years proves that the present unsatisfactory arrangements for the efficient treatment of fevers will be continued indefinitely unless greater powers be given to the Minister of Health. It should be made incumbent on him to review the position, to revoke earlier schemes when such appears desirable and to insist on concentration of work in larger units with resident medical staffs. In short, he should be able to formulate schemes to ensure the greatest efficiency in treatment in any particular area. Failing additional powers he could refuse to approve schemes which did not provide adequate treatment in so far as they included small hospitals without a resident medical officer.

In recent times a great deal has been done to rationalise various industries with a view to increased efficiency and the lowering of working costs, and effective pressure is being brought to bear in cases in which desirable amalgamations have not been made voluntarily. Surely the same principles could be applied to our present fever hospitals with a view not only to economy but to the better treatment of the patients.

A COMBINED MUNICIPAL AND FEVER HOSPITAL

Now that patients suffering from pulmonary tuberculosis and orthopædic patients have been nursed in fever hospitals without bad results, the question has been raised as to whether the fever hospital could not form a part of the municipal hospital. In this connexion it has to be remembered that the nurses in fever hospitals must be protected against diphtheria, scarlet fever and the enteric group; that children in the orthopædic wards must be protected against diphtheria; that nurses from any particular fever ward should not mix freely with the nurses from other wards, and, when they are transferred from fever wards to duty in other wards, steps should be taken to ensure that they are not carriers. This shows that the addition of fever wards to the municipal hospital would add to the difficulties of the medical superintendent and matron and might have serious results when these officials were not thoroughly versed in fever administration. The resident medical officers in charge of the fever wards might at times have no special fever experience and be out of touch with the health office staff. The plea has been made that fever wards in slack times could be used to relieve crowding in the general wards, but a moment's consideration is enough to convince one of its futility except to get over a temporary difficulty until new accommodation is provided. Taking all these matters into consideration it would seem that the disadvantages of the combination of the municipal and fever hospitals far outweigh its advantages.

EXPEDIENTS JUSTIFYING THE APPOINTMENT OF A RESIDENT MEDICAL STAFF

In cases in which the number of beds in a fever hospital fails to justify the appointment of a resident medical staff, the difficulty may be overcome in the following ways. The number of beds can be increased by the building of wards in the fever-hospital grounds for the nursing of tuberculosis and orthopædic patients. The municipal laboratory may be established at the fever hospital and sputum swabs and bloods, sent by general practitioners, examined there. General practitioners may be invited to call out the senior resident medical officer to see or consult regarding doubtful cases, and at times the senior medical officer may be attached to the staff of the medical officer of health and put in charge of fever work generally. Such expedients are worth while when the medical officer of health cannot otherwise obtain a resident medical staff for the fever hospital.

CONCLUSION

The primary object of these notes is to emphasise the need for the more efficient treatment of the fever patient which can only be effected by the centralisation of fever work in large units with a resident medical staff. To attain centralisation in a reasonable time additional powers and duties must be assigned to the Minister of Health.

The position is well summed up in the report of the Committee on Scottish Health Services, 1936, as follows: "The small infectious disease hospital providing for only the three diseases—diphtheria, scarlet fever and enteric fever—is now regarded as obsolete; with modern transport facilities it is no longer necessary except in a few areas; it cannot provide the facilities for treatment that modern knowledge demands; and in relation to its effectiveness it is uneconomic."

Smoke Abatement

A draft order has been prepared by the Ministry of Health extending the list of noxious and offensive gases and works covered by the Public Health (Smoke Abatement) Act, 1926. Copies of this draft order may be seen at the Ministry of Health or purchased through the Stationery Office. A public inquiry will be held on this order by the Ministry's chief inspector of alkali and other works at the Ministry of Health on Sept. 1 at 11 A.M. Any interested person may attend and give evidence.

LETTERS TO THE EDITOR

OXYGEN IN CORONARY THROMBOSIS

SIR,—In your issue of Aug. 5 Dr. Poulton writes on oxygen therapy in coronary thrombosis. At Passavant Memorial Hospital, Chicago, whilst I was there in 1934–36, it was and had been a routine, under Dr. M. Herbert Barker, to use the oxygen-tent in treating this condition. We found administration through the forked nasal tube too often impracticable because of the patient's restlessness, and therefore abandoned it. In using the tent it was very important at the outset to explain to the patient what was being done and why, and in some cases extreme restlessness made even its use impossible. We found it necessary to use high concentrations of oxygen but we never exceeded 60–70 per cent. Another point of great importance was the careful control of the carbon-dioxide concentration and we estimated both the oxygen and carbon-dioxide content of each air sample. Long continuous periods in the tent were essential and one could only judge when it was safe to remove the patient by gradually lowering the percentage of oxygen in the tent at the end of 5–7 days, and noting the effect on the patient. I am convinced that the intermittent giving of oxygen is valueless. To do all this it is imperative to have an "oxygen service" such as they have at Passavant. Too often failure is attributed to the oxygen rather than to the operator.

The relief of the pain, cyanosis and restlessness—especially the latter—was dramatic, as is noted by Dr. Poulton. I agree with him that this country is unfortunately suffering from oxygen-lack.

I am, Sir, yours faithfully,

THOMAS SIMPSON.

Cheshire Joint Sanatorium, Market Drayton, Salop, Aug. 9.

LEAD LYING DORMANT?

SIR,—In your last issue you have a report of an inquest headed with the words "lead lying dormant?" It is the note of interrogation which prompts this letter. During the last war, when stationed in a district largely populated by C.3 men, one saw a very large number of cases of acute lead colic in men who had been free from such symptom for many years. Some of these narrowly escaped removal of their appendices. More interesting still were the cases of acute anæmia, paresis, and so forth, in quite young men whose occupations exposed them to the risk of lead poisoning and whose symptoms seemed to have been occasioned by the unusual physical exercises involved in army life. In both classes of case it seemed impossible to doubt that lead had been lying dormant, only to be brought back into circulation by military service.

I am, Sir, yours faithfully,

Sevenoaks, Kent, Aug. 12. GORDON WARD.

BIOPSY OF THE ENDOMETRIUM

SIR,—From your interesting leading article last week one gains the impression that biopsy curettage in this country is an innovation, and mention is made of the uterine aspirator described by Lorincz and Davis this year (*Brit. med. J.* 1939, **1**, 261).

There is no doubt at all that the so-called office technique, using a small biopsy curette, is an invaluable aid to the correct administration of hormones for menstrual disorders or sterility, and a saving in time and money to the hospital. Such biopsies have been carried out by me in the outpatient department of the Royal Infirmary, Bristol, since the end of 1936, using a suction curette designed by myself (*Lancet*, 1937, **1**, 698) or a still more simple curette designed by Sharman and Sheehan (*Brit. med. J.* 1937, **1**, 965). By the use of these biopsy curettes excellent pieces of endometrium can be obtained for section, and for all but the most nervous patients with no anæsthetic of any kind; they can go home immediately without any discomfort.

This method of diagnosis of ovarian activity should be more widely appreciated by gynæcologists. Considerably more sections of endometrium, obtained at a sensible time in the cycle, would give valuable aid to the endocrinologist and would vastly simplify the pathology and physiology of the endometrium to the pathologist, who should also be supplied with a detailed menstrual history.

I am, Sir, yours faithfully,

Bristol, Aug. 12. GEORGE L. FOSS.

PHYSICAL METHODS IN RHEUMATIC DISEASE

SIR,—I am not surprised to read Dr. Troup's letter in reply to the report by Sir Leonard Hill, F.R.S., and myself published by the Empire Rheumatism Council. No doubt all the methods we criticise are in use and no doubt also they will be hotly defended by their users. Herein lies the key to the unfortunate position which physical medicine occupies today. The system of testing and approving (or otherwise) of apparatus to be used for physical treatments carried out by the physical-medicine committee of the American Medical Association is one that cannot fail to recommend itself to those who have the welfare of this subject in mind.

I am, Sir, yours faithfully,

H. J. TAYLOR

Empire Rheumatism Council, Alexander Maclean Laboratory, Ranelagh Road, S.W.1, Aug. 14.

THE NIGHT-BLIND AIR-RAID WARDEN

SIR,—I was on duty during the black-out, and encountered, like all other A.R.P. workers, the difficulty of doing my job in a darkness that seemed very nearly complete. It seemed to me however—and this is the point—that seeing in the dark was much more difficult than it had been during last winter when taking country walks at night. At that time I was taking the normal winter precaution of a course of halibut oil. But I had discontinued that for about five months before the black-out, when I found my night vision, apparently, so poor.

What I want to know is—was the deterioration in my eyesight only a subjective impression, or are there real grounds for the story that halibut oil improves the capacity to see in the dark? If the latter, then we of the A.R.P. ought certainly to take appropriate action.

I am, Sir, yours faithfully,

Aug. 15. AIR-RAID WARDEN.

*** Night-blindness and sluggish adaptation to changing states of light and darkness are associated with deficiency of intake or absorption of vitamin A, and should be cured or alleviated with cod-liver oil or halibut-liver oil. To quote from our own columns, M. K. Maitra and L. J. Harris found that only 40 per cent. of 200 elementary-school children in Cambridge and the east of London showed normal dark-adaptation, compared with 90 per cent. of public-school boys; but deficiency was less evident as age increased, for none of 38 mothers bringing children

to a school clinic were definitely subnormal, and 18 out of 22 healthy adults were normal in adaptation (*Lancet*, 1937, **2**, 1009). N. T. Gridgeman and H. Wilkinson (1938, **1**, 905) tested about a hundred healthy adults and thought that some 30 per cent. were subnormal. The improvement on taking vitamin A did not, however, seem very great. C. Vaillant and L. Gillis (1939, **1**, 149) record a case of severe night-blindness cured with vitamin A though the patient's diet appeared normal.—ED. L.

THE PROBLEM OF MEDICAL LITERATURE

SIR,—In 1807 Sir John Sinclair, famous father of the Board of Agriculture, published in four volumes his "Code of Health and Longevity," undertaken, as he said, to ascertain "how far it was practicable, to condense and systematize human knowledge, concerning any particular branch of science, the necessity of which, is becoming every day more apparent." On Sinclair's plan, science was to be divided into its different branches, and for each division "an intelligent person" was to analyse all that was published on it. Collections were to be made of the writings of every author, whether ancient or modern, who had written either directly or indirectly on the matter in question, and all valuable observations were to be abstracted and digested by "an able person . . . with a committee of assistants." A concise summary was to be translated, at the expense either of the Government or of a society established for the purpose, into all the principal languages of Europe. Such a work would then be regarded as a code (hence the title of Sir John's book on longevity) to which all future publications regarding it must refer.

"Unless some such mode, of arranging and condensing human knowledge, is fallen upon, the world will be overwhelmed with a load of literature, without deriving, in any degree, that advantage from it which might otherwise be obtained. Indeed, in its present state, knowledge may be compared to a small portion of gold, dispersed throughout a great quantity of ore. In its rude condition, the strongest man cannot bear its weight, or convey it to a distance; but when the pure metal is separated from the dross, even a child may carry it without difficulty."

I am, Sir, yours faithfully,

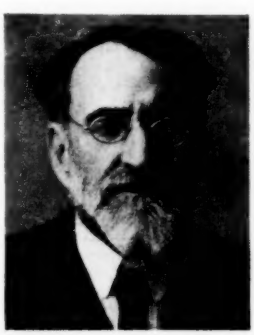
Aug. 11. Dr. PANGLOSS.

OBITUARY

RICARDO JORGE

M.D.

Professor Jorge, whose death on July 31 was recorded in our last issue, won his international reputation by his work on the major epidemic diseases, notably on plague, typhus and yellow fever, on which he was the acknowledged successor of Carlos Chagas. He was born in 1858, and after studying medicine in his native town of Oporto soon made his mark—not without much opposition but with the active support of Camera Pestana—by his campaign against plague, indigenous in Portugal until late in the nineteenth century. A number of brilliant studies, including the epidemic of the "zaire," from which emerged new light on the prophylaxis of cholera, made his name known across the frontiers of Portugal, and his appointment as director-general of public health widened the field of his activity. He represented his country on the International Health Office, Paris, from 1912, when Portugal ratified the Rome agreement of 1907, continuously until his death. His first report to it was on undulant fever and since then have followed a long series of reports, monographs and communications in discussion, duly reported in the Monthly Bulletin of the Office, on a wide range of communicable diseases and on the problems that confront the practitioner and the administrator called upon to treat and to prevent. Of many examples, bearing witness to his ability and erudition, may be cited his contributions to the study of pellagra, his classical analysis of the relation of alastrim (variola minor) to smallpox, his description of an outbreak of Weil's disease in Lisbon traced to a rat-infected fountain, and his review of encephalitis following vaccination, published in our own columns in 1932. But he was happiest when engaged in the study, and, especially in his later years, in the historical research into his two favourites, plague and yellow fever. On yellow fever, of which he had seen much in Portugal and in Brazil where he worked with Chagas, he was an acknowledged authority. The later "jungle" type of that disease, however, caused in him much perplexity of mind and he never could quite accept the evidence and the hypotheses on which this new form and conception of amarillic infection were based. He could swallow, up to a point, evidence of the presence of the virus as shown by the mouse-protection test, and of an amaril-like infection demonstrated by liver section post mortem, but he could never quite satisfy his instincts and his desire for clinical evidence of the recognised signs, symptoms and high mortality of true yellow fever, so often absent in the so-called jungle variety of that disease. Consequently, the spread of the virus in recent years throughout Brazil, and the discovery of an alleged case at Wau in the Sudan and later at Malakal, disturbed him; and to the end he was not converted. Nor (it must in fairness be said) are all his colleagues. On plague it suffices to recall the following contributions from his pen: "The rôle of rodents and fleas in the conservation and transmission of plague," "Sylvan plague and its distribution in Africa," and lastly his "*Summa epidemiologica* of the knowledge of plague."



Besides representing Portugal at the Paris Office, Ricardo Jorge was an original member of the health committee of the League of Nations on which he was appointed in 1923. The many demands of his work as director-general of public health in Portugal did not prevent him from acquiring renown in matters national and cultural. His supple intelligence ranged over a large variety of subjects in art, literature, the etymology and science of language, philosophy and history, and he has been compared with the savants of the Renaissance—encyclopædists to whom nothing was unknown. His works on Greco are celebrated. He revealed and recalled by his studies the grandeur of the Portugal of the seventeenth century, particularly by those on Rodrigues Lobo. By his historical

research he dissipated and refuted the many calumnies surrounding the life and death of Jean II. In contemporary affairs he was an ardent and sincere admirer of England and English institutions. He held, and expressed, often in international debate, in so forcible a manner as to embarrass his English colleagues, that England and Englishmen were the birth-place and founders of hygiene, and to them only was due all that was worth while in the promotion and development of the public health.

Small and frail in stature, the gentlest and the kindest of men, Ricardo Jorge seemed to his associates, in these modern times, something ethereal, like a fine piece of old porcelain.

FRANK ROMER

M.R.C.S.

Frank Romer was born in 1871, the fifth and youngest son of Sir Robert Romer, senior wrangler, chancery judge, and chairman of a royal commission on hospitals. He was educated at Sherborne where he won his rugger "cap." Later he played rugger for Middlesex: his caps always hung in his consulting-room and at his request were buried with him. He trained at St. George's Hospital and after qualifying commenced general practice at Malmesbury in Wiltshire. While there he injured his back when hunting and became a patient of the late Mr. Wharton Hood, the first medically qualified "bone-setter." Romer was so impressed with Wharton Hood's work and methods that he joined him in partnership, and after Wharton Hood's retirement continued the practice and specialised in this branch of treatment. With great rapidity his work increased, his success being due both to his enthusiasm in developing the treatment of injuries along his own lines and also to his possessing a truly wonderful pair of hands. His ideal was the earliest possible restoration of function to the injured part; this he achieved by immobilisation for the shortest possible period, encouraging early movement and commencing massage at the beginning of treatment. He held strong views as to the type of massage to be employed and trained his own masseuses in his own methods. He also devised many forms of remedial exercises to meet individual cases. His methods were his own—unorthodox in many cases, but often crowned with success.

[*Lafayette*

During the war he was medical officer on the late Earl of Dunraven's hospital yacht, the *Grainaig*, which evacuated casualties from places as distant as the Near East. While visiting an injured sailor on a destroyer in a rough sea he injured his right leg and was transferred to shore, becoming specialist at the military hospitals of Edgbaston, Croydon, and Millbank in his own line of work. His system of medical gymnastics and his method of treatment of injuries brought him into contact with Robert Jones and began a friendship which was of benefit to both. After the war he became consultant surgeon to the Jockey Club and the National Hunt and was honorary surgeon to the College of Music and the Booksellers' Benevolent Society. He was also an officer of the Order of St. John of Jerusalem.

Romer was both versatile and talented. He painted some delightful water-colours of racehorses and also executed some good models. He wrote extensively and well, not only medically, but also racing novels. His charm and vivid personality made him countless friends, and in the Bath Club, a favourite haunt, he had the affection of both members and staff. Indeed the annual golfing dinner with Frank Romer in the chair was always a very happy evening—almost an institution. Though his latter years were marred by constant suffering and many operations on his leg, culminating in amputation, he was never known to grumble at fate, and sitting in his wheel-chair he carried on cheerfully with his work to the last.

HERBERT JAMES

C.B., C.M.G., O.B.E., F.R.C.S., D.P.H.

Colonel James, who died on Aug. 9 at Gilston, Southern Rhodesia, was the last of three distinguished brothers. Sydney, the eldest, at one time headmaster of Malvern, was archdeacon of Dudley; Montague, the youngest, was provost of Eton from 1918 till his death in 1936. The father of this distinguished trio was the Rev. Herbert James, rector of Livermere, Suffolk.

H. E. R. James was born in 1857 and received his medical education at Charing Cross. He entered the R.A.M.C. in 1882 and served in it until his retirement in 1908. After this he was attached to the general staff at the War Office for training medical units of the officers' training corps, until his final retirement on account of age in 1922. During the Sino-Japanese war of 1894–95 James was attached to the Chinese army and awarded the Double Dragon of China for services to the Chinese wounded. From 1914 to 1918 he rejoined the active list and served in Egypt and Salonika in command of a general hospital.

James was an outstanding figure in the R.A.M.C. After two years as secretary to the commission of reorganisation of the army medical services after the South African war, he was appointed first commandant and director of studies at the Royal Army Medical College, on its move from Netley to Millbank in 1902. He served in this capacity for six years, and by his tact, courtesy and kindly disposition he became a friend for life to his students. His active brain, his learning, his knowledge of men and affairs, and a stern sense of discipline helped him to make an enduring success of the college in its new surroundings. There are many senior officers of the R.A.M.C., both regular and territorial, who owe much to the training, advice and sympathetic help which they received in their young days from Bertie James.

DR. JAMES FREDERICK EDMUND BRIDGER, who died on Aug. 8, was born on March 31, 1875, and educated at St. Mary's. In 1905 he became health officer to the colonial government of Barbados. For a while he was superintendent of the Pelican Island smallpox hospital in Barbados, and then port medical officer. He was thus naturally chosen to be a member of the Barbados government commission which investigated the quarantine system of the port sanitary authority of New York. He also sat on a commission to report on an epidemic of eruptive fever at Port of Spain, Trinidad. Later he was translated to Ceylon where he became director of medical and sanitary services, and also principal of the Ceylon medical college. He retired from the colonial medical service in 1930.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUG. 5, 1939

Notifications.—The following cases of infectious disease were notified during the week: Smallpox, 0; scarlet fever, 1508; diphtheria, 775; enteric fever, 24 (59 "expected"); pneumonia (primary or influenzal), 398; puerperal pyrexia, 178; cerebro-spinal fever, 21; acute poliomyelitis, 16; acute polio-encephalitis, 4; dysentery, 41; ophthalmia neonatorum, 100. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Aug. 11 was 2623, which included: Scarlet fever, 655; diphtheria, 498 (carriers, 16); measles, 15; whooping cough, 652; puerperal fever, 13 mothers (plus 7 babies); encephalitis lethargica, 303; poliomyelitis, 16. At St. Margaret's Hospital there were 13 babies (plus 4 mothers) with ophthalmia neonatorum.

Deaths.—In 126 great towns, including London, there was no death from smallpox or enteric fever, 5 (0) from measles, 2 (0) from scarlet fever, 6 (3) from whooping-cough, 14 (1) from diphtheria, 21 (3) from diarrhœa and enteritis under two years, and 6 (0) from influenza. The figures in parentheses are those for London itself.

Fatal cases of diphtheria were scattered over 11 great towns, Middlesbrough, Southport, and Walsall each reporting 2. Birmingham had 3 deaths from diarrhœa, Barking, Liverpool, Manchester, Sunderland, and Nottingham each 2.

The number of stillbirths notified during the week was 214 (corresponding to a rate of 34 per 1000 total births), including 30 in London.

MEDICAL NEWS

University of Glasgow

A short course of lectures on some recent advances in ophthalmology will be given on Tuesdays from Sept. 5 to Oct. 10 at 4.30 P.M. in the Tennent Memorial Building, 38, Church Street, Glasgow. Prof. A. J. Ballantyne will discuss problems of vision in aviation at the first lecture and radiodiagnosis and radiotherapy at the last. Other speakers will include Dr. John Marshall (problems of blindness—causes and prevention), Dr. I. Chesar Michaelson (pressure problems—ocular, cerebral and circulatory), Prof. A. Löwenstein (the eye and nervous diseases), and Dr. A. M. Wright Thomson (ocular therapeutics). The lectures are open to all who are interested.

Preventive Pædiatrics

The seventh congress of the Association Internationale de Pédiatrie Préventive will be held in Lausanne from Sept. 22 to 24. The main subjects for discussion will be prophylaxis of physical and mental disorders in puberty; and maternal and infant welfare in rural areas. Further information may be had from Dr. D. Oltramare, secretary of the association, 15, rue Lévrier, Geneva.

Billeting in Brief

A summary of the Government evacuation scheme for children, with hints to householders who would be called upon to care for other people's children, is given in a pamphlet, "Billeting in Brief," just issued jointly by the National Union of Teachers and the Save the Children Fund, price 2*d*. In it the authors have summarised information in the Government publications and have added some sensible hints on diet, playtime, spots, temperatures and the like.

Madras Medical Council

Cases of advertisement by registered medical practitioners in the lay press and by means of handbills have lately been reported to the council. At a meeting on April 17 the council therefore decided to warn practitioners that all such advertisements—including even the opening of private institutions, inviting laymen to attend such functions, and the reporting of these functions in the lay press—will be considered as contravening section 6 of the warning notice published by the council and will be dealt with accordingly.

International Congress of Hydrology

The sixteenth Congrès International d'Hydrologie, de Climatologie et de Géologie Médicales will be held at Strasbourg from Oct. 8 to 13. Further information may be had from Prof. Vaucher, Institut d'Hydrologie thérapeutique et Climatologie, 1, Place de l'Hôpital, Strasbourg.

International Congress of Gastro-enterology

The Société Internationale de Gastroentérologie will hold its third congress next year in London from July 14 to 18. Sir Arthur Hurst will preside and the chief subjects for discussion will be the relationship between diseases of the blood and gastric diseases; and regional ileitis. Further information may be had from Dr. Thomas Hunt, 49, Wimpole Street, London, W.1.

Medical Diary

Aug. 21 *to Aug.* 26

PADDINGTON MEDICAL SOCIETY.
TUESDAY.—9 P.M. (Town Hall, Paddington, W.2), Case Problems in General Practice.

EDINBURGH ROYAL INFIRMARY.
THURSDAY.—5 P.M., Dr. R. G. Gordon: Emotional Disturbances as a Cause of Physical Disorders. (Honyman Gillespie lecture.)

Appointments

ASHFORD, HAZEL I., M.D. Edin., D.P.H., assistant medical officer for maternity and child welfare for Burnley.

CLARKE, ELIZABETH M. R., M.B. Dubl., L.M., D.T.D., assistant school medical officer for Burnley.

GRAHAM, E. W., M.B. Edin., D.P.H., medical officer of health for Stowmarket urban district, Gipping and Samford rural districts, and assistant county medical officer for East Suffolk.

HOLT, R. L., M.D. Manc., F.R.C.S., hon. assistant surgeon to the Manchester Royal Infirmary.

MCBRIDE, W. S., M.B. Belf., assistant school medical officer for Stoke-on-Trent.

PAYTON, C. G., M.D. Birm., M.B. Edin., D.P.H., medical officer of health for Stourbridge.

RATCLIFFE, T. A., M.B. Camb., D.P.M., D.C.H., senior assistant medical officer at the City Mental Hospital, Nottingham.

ROBERTS, MORRELL, M.D., D.Sc. Manc., M.R.C.P., clinical pathologist to the Manchester Victoria Memorial Jewish Hospital.

ROBERTSON, DAVID, M.D. Glasg., consulting psychotherapist to the Harrogate and District General Hospital.

Colonial Service.—The following appointments and promotions are announced:—

GRAY, N., M.B., medical officer, West Africa;
LAWSON, T. L., M.B. Dubl., medical officer, Uganda;
LEE, S. W. T., M.D. Belf., D.T.M., D.P.H., D.O.M.S., senior medical officer in charge, Zanzibar;
MANSON-BAHR, P. E. C., M.B. Camb., M.R.C.P., medical officer, Tanganyika Territory;
NEVIN, H. M., M.B. Dubl., D.T.M., D.P.H., pathologist, Penang;
OBERWARTH, U. E., M.D. Berne, district medical officer, Bahamas;
TOMLINSON, P., M.B., medical officer, Malaya; and
WINCHESTER, J. W., M.D. St. And., D.M.R.E., radiologist, Malayan medical service.

London County Council.—The following appointments and promotions are announced. A.M.O. (I) or (II) = assistant medical officer, class I or II:—

BROWNRIGG, E. K., M.R.C.S., A.M.O. (II), St. Luke's, Chelsea;
DUNKLEY, E. W., M.B. Lond., A.M.O. (II), St. Pancras;
EASON, T. J., M.B. Edin., F.R.C.S.E., A.M.O. (I), New End;
EVANS, HELEN M., M.R.C.S., D.P.H., an assistant medical officer on the central medical staff of the public health department;
EWAN, W. J. S., M.B. Aberd., A.M.O. (II), Hackney;
INGHAM, C. W. J., M.D. Dubl., divisional medical officer on the central medical staff of the public health department;
INNES, C. B., M.B. N.Z., A.M.O. (I), Bethnal Green;
LIGGETT, S. W., M.B. N.U.I., F.R.C.S.E., A.M.O. (I), St. James';
NEILSON, JOHN, M.B. Glasg., A.M.O. (II), Hackney;
PALSER, E. G. M., M.B. Lond., A.M.O. (I), Bethnal Green;
PARKER, G. F., M.D., A.M.O. (II), Queen Mary's, Sidcup;
SEARS, W. G., M.D. Lond., M.R.C.P., medical superintendent, Mile End;
WRIGLEY, A. J., M.D. Lond., F.R.C.S., F.R.C.O.G., part-time obstetrician and gynæcologist on the consultant and specialist staff at Lambeth Hospital; and
YEATES, J. M., M.B. Sydney, A.M.O. (I), Queen Mary's, Carshalton.

Vacancies

For further information refer to the advertisement columns

Abercrave Workmen Medical Committee.—Medical practitioner.
Accrington, Victoria Hosp.—H.S., £175.
Bath, Royal United Hosp.—Hon. anæsthetist.
Bedford County Hosp.—Third H.S., at rate of £150.
Birmingham, Canwell Hall Babies' Hosp.—Res. M.O., at rate of £250.
Birmingham Children's Hosp.—Res. surg. O., £175. Also asst. res. M.O. and asst. pathologist, £125.
Birmingham, St. Chad's Hosp.—H.P. and anæsthetist, at rate of £150.
Brighton, Royal Alexandra Hosp. for Sick Children.—H.S., £150.
Brighton, Royal Sussex County Hosp.—Two H.S.'s, £150.
British Postgraduate Medical School, Ducane Road, W.12.—Cas. O., at rate of £150. Also two H.S.'s, each at rate of £105.
Cardiff, King Edward VII Welsh National Memorial Assn.—Area asst. tuber. officers, each £500. Also two asst. res. M.O.'s for Sully Hosp., each £200.
Central London Ophthalmic Hosp., Judd Street, W.C.1.—Sen. and jun. H.S.'s, £200 and £150 respectively.
Colchester, Royal Eastern Counties' Institution, &c.—Med. supt. for Bridge Home, Witham, £750.
Dorking County Hosp.—Res. asst. M.O., at rate of £250.
General Lying-in Hosp., York Road, Lambeth, S.E.1.—Jun. res. M.O. and anæsthetist, at rate of £100.
Glasgow Corpn.—District medical officer, £600.
Gloucester, Gloucestershire Royal Infirmary.—H.S. to ear, nose, and throat dept., at rate of £170.
Greenwich, Metropolitan Borough.—Asst. M.O., £500.
Grimsby County Borough.—Asst. M.O., £500.
Hounslow Hosp., Middlesex.—Hon. physician for physiotherapeutic dept.
Hull Royal Infirmary.—Second H.S., at rate of £150.
Ilford Borough.—Asst. dental surgeon, £450.
Kingston County Hosp., Surrey.—Res. asst. M.O. (anæsthetist) at rate of £250.
Leicester Royal Infirmary.—Resident appointments.
Lincoln County Hosp.—Hon. anæsthetist and two hon. asst. physicians.
Liverpool City Infectious Diseases Hosp.—Res. asst. M.O.'s, £250.
London County Council.—Asst. M.O.'s Class I and II, £350 and £250 respectively.
London Hosp., E.1.—First asst. and registrar to ear, nose, and throat dept., £150. Also surgical first asst. and registrar, £300.
Manchester, Barnes Convalescent Hosp.—Res. jun. M.O., at rate of £150.
Manchester, Park Hosp., Davyhulme.—Res. obstet. officer, £400.
Manchester and Salford Hosp. for Skin Diseases.—H.S., at rate of £150.
Manchester Royal Infirmary.—Two jun. asst. M.O.'s in radiological dept., each £350.
Middlesbrough, North Riding Infirmary.—Sen. H.S., at rate of £175.
National Temperance Hosp., Hampstead-road, N.W.1.—Cas. O., at rate of £120. Also H.P., at rate of £100.
Newcastle-upon-Tyne, Barrasford Sanatorium.—Res. med. asst., £250.
New Zealand, Wellington Hosp. Board.—Orthopædic registrar, £500.
Northampton General Hosp.—Res. cas. O., res. anæsthetist, also res. H.S. to ear, nose, and throat dept., each at rate of £150.
Northumberland County Council.—County M.O.H. and school M.O., £1200.
Norwich, Jenny Lind Hosp. for Children.—Hon. asst. surgeon to orthopædic dept. Also Res. M.O., £120.
Norwich, Norfolk and Norwich Hosp.—Hon. asst. orthopædic surgeon.
Nottingham Children's Hosp.—Res. H.P., at rate of £150.
Nottingham City Mental Hosp.—Jun. asst. M.O., £475 or £350.
Oxford, Radcliffe Infirmary.—Res. surg. O., at rate of £150. Also H.P.'s and H.S.'s, each at rate of £100.
Pembroke County War Memorial Hosp., Haverfordwest.—Res. H.S., £200.
Prescot, Whiston County Hosp.—Res. surg. O., £400.
Preston and County of Lancaster Royal Infirmary.—Res. obstet. officer, £350. Also cas. H.S., at rate of £150.
Prince of Wales's General Hosp., N.15.—Res. jun. H.P. and H.S.'s, each at rate of £90.
Queen's Hosp. for Children, Hackney Road, E.2.—H.P. and ear, nose, and throat H.S., each at rate of £100. Also physician for whooping-cough clinic, 1 guinea per attendance.
Queen Mary's Hosp. for the East End, Stratford, E.15.—Res. M.O. and cas. O., each at rate of £150. H.S. and H.P., each at rate of £120. Also obstet. H.S., at rate of £110–£130.
Redhill County Hosp., Surrey.—Res. asst. M.O., at rate of £250.
Royal Cancer Hosp., Fulham Road, S.W.3.—Res. H.S. to radium dept., also H.S., each at rate of £100.
Royal College of Physicians of London.—Milroy lecturer.
Royal Naval Medical Service.—Medical officers.
Salford City.—Asst. clin. tuber. officer, £500.
Salisbury General Infirmary.—H.S., at rate of £125.
Samaritan Free Hosp. for Women, Marylebone Road, N.W.1.—H.S., at rate of £100.
Sheffield, Jessop Hosp. for Women.—Res. M.O., at rate of £150.
Southampton, Free Eye Hosp.—H.S., at rate of £150.
Stoke-on-Trent City.—Asst. M.O. for maternity and child welfare, £500.
Swansea County Borough.—Asst. M.O., £500.
Warwick, King Edward VII Memorial Sanatorium, Hertford Hill.—Jun. asst. M.O., at rate of £250.
Weir Hosp., Weir Road, Balham, S.W.12.—Jun. res. M.O., £150.
West Ham County Borough.—Two R.M.O.'s at Whipps Cross Hosp., £350.
West London Hosp., Hammersmith, W.6.—H.P. and H.S., each at rate of £100. Also genito-urinary surgeon.
West Riding of Yorkshire County Council.—Asst. bacteriologist, £650.
Wigan, Royal Albert Edward Infirmary and Dispensary.—Pathologist and bacteriologist, £500.
Willesden Municipal (Fever) Hosp., Neasden, N.W.10.—Res. M.O., £250.
Wolverhampton County Borough.—Temp. asst. M.O.H., £600.
Woolwich and District Hosp. Assn., Shooters Hill, S.E.18.—H.S. and cas. O., at rate of £100.
York County Hosp.—H.P., £150.

The Chief Inspector of Factories announces a vacancy for an examining surgeon at St. Blazey, Cornwall.

Births, Marriages and Deaths

BIRTHS

CALTHROP.—On Aug. 5, at 23, Upper Wimpole Street, W.1, the wife of Dr. G. T. Calthrop—a son.
CLEGG.—On Aug. 10, the wife of Dr. W. B. Clegg, of Bishops Castle—a daughter.
HARRIS.—On Aug. 5, at 11, Alexandra Park Road, N.10, the wife of Dr. J. S. Harris—a son.
JAMES.—On Aug. 5, the wife of Dr. Eric James, of Solihull, Warwickshire—a son.
KELLY.—On Aug. 9, the wife of Dr. J. O. Kelly, of Lanark—a daughter.
LEECH.—On Aug. 9, at Mengo, Uganda, the wife of Dr. R. Bosdin Leech—a daughter.
LLOYD.—On Aug. 7, at Aldeburgh, Suffolk, the wife of Dr. W. Jeaffreson Lloyd—a daughter.
LODGE.—On Aug. 8, the wife of Dr. John Lodge, of Edinburgh—a son.
WOODGATE-JONES.—On Aug. 13, at 19, Bentinck Street, W.1, the wife of Dr. N. P. Woodgate-Jones—a son.
YARDLEY.—On Aug. 8, the wife of Dr. G. E Yardley, of Windsor—a son.

MARRIAGE

MILLER—BOWER.—On Aug. 12, at St. John's Church, Hyde Park Crescent, William Archibald Montgomerie Miller, M.B., to Dorothy Mary Bower.

DEATHS

BOWIE.—On Aug. 13, at 17, Sydney Street, Chelsea, S.W.3, Albert William Bowie, M.B. Edin., L.M.
BRIDGER.—On Aug. 8, at Balladoyle, Slinfold, Sussex, James Frederick Edmund Bridger, M.B. Lond., formerly director of medical and sanitary services, Ceylon, aged 64.
JAMES.—On Aug. 9, at Gilston, Salisbury, S. Rhodesia, Herbert Ellison Rhodes James, C.B., C.M.G., O.B.E., F.R.C.S., lieut.-colonel R.A.M.C. (retd.).
MCCONAGHY.—On Aug. 9, at Camberley, Christopher Birdwood McConaghy, M.B. Edin., lieut.-colonel I.M.S. (retd.).
WATTS-CLARKE.—On Aug. 13, at 23, Kelsey Park Road, Beckenham, Richard Edward Watts-Clarke, M.B. Edin.

N.B.—A fee of 7s. 6d. is charged for the announcement of Births, Marriages, and Deaths.

THE LANCET 100 YEARS AGO

August 17, 1839, *p.* 743.

Clinical remarks, by Sir Benjamin Brodie.

OPERATIONS.—When I was a young hospital surgeon I entertained a very exalted idea of operative surgery, and thought very highly of the great importance of *immediately* performing an operation whenever it might seem to be required. I have had much experience, however, since that time, and I now think that some little circumspection should be used beforehand, . . . You should consider well what the effect of an unsuccessful operation will be upon the minds of society at large, for every surgical operation that fails prevents two or three persons from submitting, in cases where the use of the knife might be successful. This caution is required at once on behalf of ourselves, of society, and of our art. Do not, then, always operate when you will by no means be sure of success. . . . And at all times inquire into the state of the general health. Learn if the patient be a drunkard or a free liver; and if so, beware. I knew a lady of fashion, who got drunk every morning, and died from the puncture of a small encysted tumour. Women of high rank are very nervous and hysterical. Persons in whose families mania may have existed are bad subjects for operations. They sometimes die afterwards in a very strange manner—with some very unusual symptoms.

NOTES, COMMENTS, AND ABSTRACTS

PRINCIPLES OF MEDICAL RESEARCH
THE DUAL CAREER

BY LORENZ S. MICHAËLIS, M.D. Berlin, L.R.C.P.E.

CLINICAL ASSISTANT IN THE ORTHOPÆDIC DEPARTMENT, ST. JOHN CLINIC, LONDON

IN two previous articles [1] I have given examples of what seem to be fundamental obstacles to the progress of medical research. First, the real limitations of highly specialised research have been ignored, thereby leading to a series of wrong conclusions. Secondly, in a different field, traditional limitations have been unjustifiably accepted as permanent, thereby seriously hampering our search for the causes of disease. By deducing these two conclusions, which sound so severely theoretical, from practical examples, I hope to have made it clear that it would be worth while trying to stop these erroneous principles from acting as guides in the future. To define them is one thing, to prevent them from continuing to exert their misleading influence another. The right way to achieve this lies, in my opinion, in postgraduate education. It is here that we have to search for the origin of the present lack of cohesion in medical thinking, of the uncertainty in applying logic to biology, and of the ever-widening gap between clinical and laboratory research.

Does not postgraduate education now tend to make the young medical Odysseus an expert in negotiating either Scylla or Charybdis, instead of teaching him how to sail his ship properly in all waters? Is there not too much temptation for the ambitious man to stop his ears early with the wax of specialist diplomas in order to escape the Sirens' island of broader interests? And, having once used the wax for this purpose, does he not often forget ever to remove it, remaining professionally deaf for the rest of his life?

THE NEED

There are three groups of recently qualified men for whom postgraduate education has to be provided. The first and largest consists of those who more or less immediately engage in practice, to which they are naturally inclined and in which they form an essential part of medical activity. The second much smaller group contains a number of exceptionally gifted people, whose gifts are such as to drive their owners irresistibly in one direction, be it surgery or physics, radiology or biochemistry.

Here we are concerned with a third group, the size of which is more difficult to judge. It might well be much greater if members of the first group were shown its possibilities. It is the group of keen and gifted men who find themselves caught in the current of competition for practice, appointments or degrees before they have had time to try and see, not only whether they belong to group 1 or 2, but whether they could not combine some of the essentials of both careers and thus build one of their own. At present there is no official recognition of these.

A few in this group have found a solution for themselves, often at the cost of severe financial strain and many disappointments. Their research work, which has not made them prisoners of their specialty, has been looked on by orthodox research specialists as amateurish and their clinical achievements have been met with distrust by clinicians on account of their "theoretical speculations."

It is, however, no accident that among them are some of the best brains and most successful explorers in medical research. Their progress on the professional ladder may have been slower than that of pure specialists, but their grasp of the problems of both clinic and laboratory is swifter and more certain because of their real experience in both spheres. Should not their pioneer efforts be used as a guide for mapping out a new third way of postgraduate education? This way would have to lie between practice only and theory only, between clinical research and its laboratory rival. It would have to combine the essentials of thought and technique of both sides, and would have to include actual work in both spheres for a period long enough to gain real experience and yet short enough to make a "dual career" possible.

The need for such a third way is greater today than ever, not only because of the bewildering growth of specialism but still more because of the need for a great number of young workers to shoulder the task of research into cancer, rheumatism and nutrition. This need is comparatively new; it calls for a new, or at least an officially new, principle in postgraduate education for research.

TRAINING FOR THE DUAL CAREER

The present system of medical education in this country has produced overwhelming proof of its efficiency in fitting the general practitioner and the specialist for his job, and I am not here suggesting that the organised study available for groups 1 and 2 should be altered. I do suggest, however, that additional provision should be made for group 3.

The young doctor would be free to choose a two years' course either in a laboratory or in the wards of a hospital. After this period he would have to produce proof of research done in either sphere under the supervision of the head of the department. This work, which would not necessarily have to be a paper for publication, would be taken into account for his higher degree, part of the examinations for which would be replaced by it. Whether entirely new degrees were instituted or existing ones modified would not matter as long as the degrees were made equal to other higher qualifications.

Having passed the examination on his first two years' work the doctor should next spend a year on the opposite side—at a hospital if his degree was gained on laboratory work and vice versa. At the end of this period, during which he would again have to carry out research, he should be able to take a second degree or pass a second part of the first examination, the quality of his research again being taken into account. Now he would be free to decide whether to go on with research, and if so whether in the laboratory or in the hospital, or whether to go into practice.

Practical research in both fields would in this way become part of the early experience of a large number of men who were to spend their lives in the laboratory, the hospital or in practice. There would be fewer of that type of research-worker who has never seen a patient and for whom he need hardly exist, and less contempt for the "rabbit monger" on the part of the practical man for whom nothing exists but the patient.

During these three years the young doctor should hold either junior house-appointments, the number of

1. *Lancet*, 1939, **1**, 186 and 856.

which would have to be increased, or correspondingly paid junior posts at laboratories, the facilities of which would have to be extended. The expense of this expansion of research should be borne by the pooled resources of the medical schools, postgraduate colleges and research organisations, all of which would ultimately gain from the raised standard and increased quantity of useful work done.

PART-TIME RESEARCH INSTITUTES

On this basis of an officially recognised third path to work and distinction the "dual career" should be carried further by providing special facilities for clinical and laboratory research for those who have done their three-year period of research training and hold the new degrees. While earning their livelihood either in a practical field or as permanent members of a laboratory team they must be able to maintain contact with the "other side" and continue as part-time research-workers.

To provide opportunities for work in the wards for members of laboratories should not be difficult. The provision of facilities for part-time research would require the setting aside of space, equipment and technical assistance. Since this new type of work might interfere with the routine of existing whole-time research, an independent research institute should be founded for it. Here expert directors would supervise research done by the part-time men, who would attend, say, twice a week for two hours according to a strict time-table.

Such an institution, once established with the help of the pooled resources of the interested bodies and gifts from donors, would form the centre of a medical research society, which might become a research section of the Royal Society of Medicine. The contributions of its members should cover part of the running expenses, but the fees should not be so high as to prohibit gifted but less prosperous men from taking part. Here the growing number of young helpers in medical research would find opportunities for active collaboration, without having to wait for one of the few openings now granted them. The centralisation of work at special institutes would allow research efforts to be directed into channels where they are most needed, and would avoid much of the present overlapping. Such organisation would also be a safeguard against the danger that a fall in the quality of research would accompany an increase in its quantity.

SUMMARY

Additions to the existing system of postgraduate education might help (*a*) to eliminate early over-specialisation and consequent lack of a balanced judgment in questions of research; and (*b*) to provide the qualified collaborators needed for research into cancer, rheumatism and nutrition.

A "dual career" should be open to the young postgraduate, based on a three years' course in theoretical as well as clinical research.

New or amended higher degrees would be instituted, in which the value of research work done under supervision would be taken into account.

The holders of the new degrees would be given adequate facilities to continue as part-time research-workers at an institute specially designed to give them access to equipment and technical assistance as well as expert advice and coördination.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.—The office and library of this association will be closed from Aug. 21 to Sept. 11.

RED CROSS

UNDER a plain title ("Story of the British Red Cross." London: Cassell and Co. 1938. Pp. 275. 8*s*. 6*d*.) Mr. S. H. Best tells a romantic tale in plain words. It was at the start of the Franco-Prussian war that Lord Wantage and Sir John Furley first conceived the idea of a National Aid Society and from it soon developed the British Red Cross. Since then there has hardly been a page in the annals of war on which it has not figured prominently. Up till the great war the society's organisation was limited, and August, 1914, found it occupying a small office in Victoria Street, without funds but with definite plans for dealing with the conflagration its organisers had foreseen. Its activities in every seat of war do not need recapitulation; to express them in terms of cash, the society had raised £17,000,000 by the end of the war. Like all pioneers it had to fight for its existence, and though many of its schemes were hailed with scorn—the V.A.D. organisation for example—they lived to justify themselves triumphantly.

Mr. Best gives little space to the post-war activities of the society, but his description of its work in Abyssinia and especially that among sufferers from mustard-gas should be read by anyone who doubts the efficacy of gas as an instrument of torture to the unprepared. He says little of the part played by the society in the blood-transfusion services or in air-raid precautions, and does not mention Spain. But there is enough to enthral anyone who cares for human and humane activities.

TREASURE TROVE

THE inquest last Monday upon the remarkable find of gold and silver articles discovered in the Anglo-Saxon ship burial at Sutton Hoo, near Ipswich, ended in a verdict that the articles were not treasure trove. The evidence of archæological experts, interesting as it was, could hardly be needed to establish that the precious objects were deliberately and publicly placed in the grave of the dead chief or king. As Sir George Hill points out in his admirable book on Treasure Trove, it is the hiding of objects and not the abandoning of them which gives the Crown a property in finds in England. It is often difficult to decide whether objects (for instance a single gold brooch or a single gold ring) have been hidden or merely thrown away or lost. The coroner in the recent case rightly pointed out to the jury that concealment in secrecy, with intention on the part of the owner to return and recover his hoard, is an essential point to consider. In the Sutton Hoo ship burial, the ship had been hauled up from a stream 100 feet below and had been dragged into a large trench 100 feet long, 20 feet wide and 10 feet deep. A large mound had been erected over the final structure, containing at least 1000 tons of turf cut from the surrounding heath. The objects of gold and silver would have been buried with the dead man for the traditional purpose of ministering to his comfort and dignity in another life. Probably the ceremony was accompanied by many days' celebration and feasting. These facts and inferences negatived any idea of hiding or concealment in the case of the Sutton Hoo treasure and therefore removed it from the technical category of treasure trove.

In the various legal systems of this and other countries there has nevertheless been doubt whether gold or silver was treasure trove when deposited in a tomb or coffin. Ancient Roman law introduced a complication by providing that to bury a body in a place was to lose possession of the place. In an Italian case, decided some forty years ago, a court in Florence held that the contents of an Etruscan tomb were treasure. In English jurisprudence, which has its own peculiarities, the so-called Laws of Edward the Confessor declared that treasures from the earth belong to the King unless they be found in a church or cemetery (*in ecclesia vel in cimiterio*).

Thirteen gold nobles found in a vault under the church floor at Halsall, lying on top of a coffin, were held by the Treasury in 1922 to be treasure trove. Here, Sir George Hill says, there was no coroner's inquest. Presumably the coins, having been placed outside the coffin, were not buried for religious reasons but with the intent to return and recover them. Sir George Hill cites another case of uncertain date where pennies of Alfred were found in the hollow of the left shoulder of a skeleton at Leigh-on-Sea. These were declared not to be treasure trove. It is a matter of history that the Crown granted licences or directions to dig in howes or barrows from early times in England in search of treasure. There is an order to the Earl of Cornwall in 1237. The rifling of hoards, whether in the interest of the public exchequer or the predatory individual, must have been common in all ages. The life of St. Guthlac shows that at the end of the seventh century the saint made his habitation in a chamber discovered by searchers for treasure in the side of a barrow. It is satisfactory to know that treasures still survive and that, as in the Sutton Hoo case, the owners will provide for their public custody.

CHEWING THE CUD AND FROG IN THE THROAT

A CASE of pseudo-rumination is reported by J. B. L. Valle, who uses the term "mericism" for it. He says that it is a nervous tic that depends on the abnormal shape of the stomach, is very rare, and is to be distinguished from involuntary regurgitation, which is very common (*Bol. Soc. med. chir. Juiz de Fóra*, 1938, **11**, 445). This chewing of the cud is commoner in men than in women and is seen in imbeciles. It hardly differs from the physiological act of ruminants and takes place usually 10–20 minutes, or rarely 3–4 hours, after food. There is possibly some connexion with aerophagy, and Valle points to the analogous action in birds (we may instance "pigeon's milk" and the pellets of robins, kestrels, owls, and kingfishers) and the custom of the ancient Romans, at their orgies, of inducing voluntary vomiting by titillation of the uvula.

Valle distinguishes two types: simple and pathological. The former is congenital in normal healthy persons and is habitual and quasi-unconscious. The pathological type is due to dyspepsia or nervous disease. He had known his patient for ten years and describes him as a healthy man aged 35, working for his living. There was no neuropathic history in the patient or his family. He had always chewed the cud, and up to the age of 12 he had thought that everybody did so. He then became anxious about his peculiarity and wished to be cured. There was no sign of disease, and his intelligence was excellent. Valle tried psychotherapy, including suggestion and attempts at voluntary control, but failed to cure him.

FIG. 1—Going down.

In this connexion it is interesting to note that there is at present a man who earns his living in the south of France partly by exploiting his powers of returning his gastric contents at will. He begins by drinking about three litres of water while balancing a chair on his forehead. Patter follows to the effect that he has drunk too much and will return some. Thereupon he ejects a stream of water about a yard long with considerable force. Next he takes a frog and, placing it head first between his lips, gradually sucks it into his mouth and swallows it (fig. 1). More patter follows, and after a minute or so he swallows a second frog. Eight frogs in all are swallowed, with intervals of patter. He then talks and laughs for about five minutes before regurgitating the frogs, which come singly out of his mouth (fig. 2) at intervals of about a minute between spells of patter. The whole process appears to be entirely voluntary. He

FIG. 2—Coming up.

gains roars of laughter and applause by announcing that one particular frog says: "When I come back to the world, I like to climb on to master's nose." The announcement of the forthcoming return of a frog precedes the frog's actual return by a few seconds.

CARDIAZOL AS A DEPRESSANT

AFTER comparing the results of treatment of schizophrenia with Cardiazol, sodium Amytal, and alcohol, W. P. Berrington (*J. ment. Sci.* May, 1939, p. 474) concludes that these drugs act in a similar manner and produce their effects on catatonic stupor by virtue of a depressant action on the highest inhibiting (cortical) centres, as originally suggested for sodium amytal by M. W. Thorner. Twelve patients were treated with alcohol, and the results were like, though less pronounced than, those of sodium amytal. Berrington also thinks that studies of prepsychotic personality of catatonic dementia præcox support the hypothesis of excessive inhibition as the modus operandi of one type of catatonic stupor.

There is much contradictory evidence about the supposed modes of action of cardiazol, but support for Berrington's view may be found in the results of earlier experiments on animals. Thus A. H. Maloney in 1936 described the production of depression and death with large doses of this drug, and A. Leroy and P. Clémens in 1937 noticed catatonic reactions to cardiazol in experiments on rats: 1 mg. caused diminution of spontaneous and of provoked muscular activity; 2 mg. produced convulsions, hyperæsthesia, and hyperkinesis; while larger doses were fatal. Their findings were confirmed by Gutiérrez-Noriega in Peru, for dogs also. J. A. F. Denyssen and D. J. Watterson (*J. ment. Sci.* 1938, **85**, 1006) found that in an intact animal small doses of cardiazol increased the reflex excitability, whereas larger doses caused epileptiform convulsions, and massive doses paralysis. Gutiérrez-Noriega, Rotondo, and Alarco (*An. Fac. Cienc. méd., Lima*, March, 1939, p. 263) divide the effects observed after the intravenous injection of cardiazol in dogs into five periods: (1) psychomotor excitation; (2) convulsions; (3) muscular inhibition and incoördination, sometimes resembling the coma that follows epileptic convulsions; (4) catatonia; and (5) recovery. In 100 experiments on 70 dogs catatonia was produced in 57 per cent. of cases, and it was also produced in 36 per cent. of experiments in 15 cats. The experimenters conclude that the catatonia was not due to the convulsions, because some of the dogs had catatonia without having had convulsions. Experiments repeated in the same dogs showed that the various reactions were always true to type for the particular dog, suggesting constitutional variation. Gutiérrez-Noriega and his colleagues conclude that cardiazol has a depressant action like that of alcohol.

STERNAL PUNCTURE

STERNAL puncture is useful for making a rapid diagnosis, especially in pernicious anæmia, pseudoleukæmia, acute leucopenic leukæmia, and aplastic anæmia,[1] but it gives little information which cannot be obtained by examining the peripheral blood. Nevertheless a book by Dr. Fieschi[2] is of great interest. It contains a gallery of hæmatological pictures obtained by sternal puncture, reproduced in 111 text figures and 10 beautifully coloured plates. Not only are the appearances minutely detailed for most blood diseases, but also an attempt is made to interpret them in terms of bone-marrow function. Special attention is paid to karyokinesis in normal and in pathological conditions. The ease with which sternal puncture can be performed may lead to many errors on the part of those inexperienced with myelograms. Consequently sternal puncture should be regarded as only one of several diagnostic methods in blood disease; and the characteristic polymorphism of the bone-marrow needs an expert to interpret it. Another difficulty is the lack of homogeneity in the distribution of the myeloid parenchyma in all bone-marrow, even in the most homogeneous tissue of the sternal marrow. Nevertheless sternal puncture has revealed invaluable information concerning the erythroblastic reactions in secondary anæmias. In the interpretation of the myelogram a qualitative analysis is insufficient; it must be quantitative to show the state of hæmopoiesis or of maturation, and the karyokinetic changes must be accurately recorded to estimate the rate of proliferation—an estimation which, however, cannot be absolute. Aberrations and degenerative phenomena in karyokinesis must also be carefully observed as clues to morbid processes.

1. Hynes, M., *Lancet*, 1939, **1**, 1373.
2. Semeiologia del Midollo Osseo. By Aminta Fieschi. Pavia: Tipographia gia Cooperativa. 1938. Pp. 354. L.70.

CHINESE ORTHOPÆDIC CENTRE

IN our issue of July 8 (p. 99) the British Orthopædic Association appealed for help in establishing an orthopædic unit behind the Chinese lines. This unit, it is hoped, will form the nucleus of an orthopædic centre which is to be established at the Emergency Medical Service Training School at Kweiyang. The training hospital attached to the school would put 300 of its 1000 beds at the disposal of the unit, which would thus be able to make use of the existing organisation for the selection of cases and train the medical personnel of army hospitals in correct orthopædic procedures. Other divisions of the centre will undertake the production and fitting of appliances, the provision of physical treatment and the supervision of exercises. Suitable vocational training will be arranged for individual cases, and finally the centre will arrange with the provincial government for the settlement of each soldier after his discharge. Orthopædic patients have to spend long periods waiting—between successive operations, or for the fitting of an appliance, or during a course of physical therapy—when it will not be possible to spare bed space in the hospital itself for them. At first these men will be accommodated in the Army Cripples' Home, but it is hoped shortly to complete the centre by establishing a disabled soldiers' hostel where they need no longer live under a hospital regime and more can be done for their welfare. An appeal for funds for this hostel is being made by the Foreign Auxiliary to the National Red Cross Society of China.

MEDICAL ABERDEEN

Dr. David Rorie compiled a singularly interesting "Book of Aberdeen" for the British Medical Association's meeting last month. Published by the executive committee of the Aberdeen division, it is printed by W. and W. Lindsay (28, Market Street) and consists of essays on the university, the medical history of the town, the medico-chirurgical society, the various hospitals, the public-health administration, the Rowett Institute and other research institutions, and the scenery, literature, historical remains, and folk-lore of the district, together with much else. Dr. Rorie's chief collaborators have been Mr. Alexander Keith and Dr. G. A. G. Mitchell, but the book is a true symposium, and many doctors have contributed their quota of information and scholarship. For the medical visitor to old and new Aberdeen no better guide could be desired.

NEW MATERNITY DEPARTMENT AT NEWCASTLE.—On Aug. 10 Mr. J. E. Scanlan opened the new maternity department of the Newcastle General Hospital. This serves to remind one that the earliest provision of hospital beds in the Newcastle workhouse was for maternity cases. The new department has three sections, which between them accommodate 30 beds. Of these 22 beds are for normal cases, 5 are for patients suffering from minor degrees of sepsis, and 3 in a separate building are for "suspect" cases. In the main the accommodation has been planned in single- and two-bedded wards, though there are two larger wards, each of 4 beds, and a nursery. For protection against air-raids, Dura-steel has been inserted in the ceilings of the operating-theatre and labour ward annexe and armoured glass has been used in the windows.